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THE UNIVERSITY OF ALBERTA

A STUDY OF THE TEACHING OF TEST-WISENESS

by



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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES  
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE  
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The undersigned certify that they have read, and  
recommend to the Faculty of Graduate Studies for acceptance,  
a thesis entitled A Study of the Teaching of Test-Wiseness,  
submitted by Aurell Royer in partial fulfilment of the  
requirements for the degree of Master of Education.



## ABSTRACT

The problem investigated in this study was whether test scores could be improved by instructing pupils in test-taking techniques.

The study involved about two hundred ninth grade pupils in four schools who were divided into three treatment groups. One treatment consisted of instruction in test-taking techniques, a second treatment consisted of ordinary classwork, and a third treatment consisted of special instruction, but in an area unrelated to testing. Each group was given two achievement tests, one before and one after the treatment. Each of the three treatment groups was divided into two subgroups in order that each of the treatment groups could be given two different types of tests. For example, the group receiving test-taking instruction was composed of two subgroups. For one of these subgroups the first test consisted of "good" multiple-choice items, while for the other group the first test consisted of "poor" multiple choice items. In the second round of testing, after the treatment, each test was again administered. A "good" posttest was administered to the subgroup which had taken a "poor" pretest and a "poor" posttest was administered to the other subgroup which had taken the "good" pretest. The other two treatment groups went through a similar testing procedure.

Correlated t-tests were used to determine whether pretest and posttest scores differed statistically among the groups. A significant difference was found between the pretest mean and the posttest mean of the group receiving test-taking instruction who wrote the "good" test and then the "poor" test. A significant difference was also found between the "poor" posttest scores of the test-taking instruction group



and the group who took regular class work.

It was concluded that students who have received instruction in test-taking techniques score higher on poorly constructed multiple-choice tests than they would have had they received no instruction.



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## CHAPTER ONE

### INTRODUCTION AND REVIEW OF LITERATURE

Test items of the multiple-choice type have been employed in the Grade IX Departmental Examinations in Alberta for about two decades. In recent years, however, there has been a movement to increase the proportion of multiple-choice items in the tests, and to adapt more tests to this form of question. In 1968 all of the six tests in the battery of final examinations for Grade IX contained multiple choice items, and in all tests these items accounted for a major proportion, if not all, of the possible marks.

It is likely that the shift away from subjectively-scored examinations was somewhat forced upon the Department of Education by the increasing enrolments. The multiple-choice type of questions seems to be generally considered the most satisfactory of the objective type items (Lindvall, 1962). The major advantages of multiple-choice test items to the Department would likely be the possibility of employing machines for scoring, complete objectivity of scoring, the possibility of performing item analyses, and the opportunity of building banks of satisfactory test items.

There has been some feeling expressed by teachers, particularly in rural areas, that even though the tests are objective, test sophisticated students from urban areas have an advantage over students from rural schools who are less likely to be test-wise. If this is true then the question arises as to whether test-wiseness can be taught and if so, how it might be done.

#### Review of the Literature

Although literature on the topic of test-wiseness is scarce





several reports were considered of value in planning and preparing this study. Pauch (1950) pointed to the necessity for equalizing the amount of advanced knowledge students have with regard to how to take examinations. Wiseman (1954) stated that there seemed no doubt that familiarity with the format of objective tests and with the methods used to indicate correct answers is of great importance in raising scores. However, learning the techniques of answering particular types of questions seems to be ineffective if the children are not also given the total test experience involved in actually writing the test. The research of Connerley and Wantman (1964), and French (1965), investigating problem solving styles of students answering objective test items, showed the need for more study of test-wiseness. Stricker (1967) showed a general lack of relationship between test-wiseness and academic ability and between test-wiseness and cognitive styles. His study suggested that test-wiseness skills exist independently of these other variables. Another important finding was the specificity of the test-wiseness measures. These findings imply that test-wiseness is not a broad general ability, but consists of a set of distinct and largely unrelated skills.

Millman, Bishop and Ebel (1965) offer an analysis of test-wiseness which can serve as a theoretical framework for empirical investigations of test-taking strategies. They were not concerned with actually measuring whether test-wiseness could be taught, but in setting a framework to study its importance. Moore, Schutz and Baker (1966) provided some empirical evidence that self-instruction of test-wiseness can be used to develop problem-solving techniques. Some shortcomings of this study were reported by Wahlstrom (1968). His criticisms were as follows: The subjects used by Moore et al. (1966) were 107 students in



four eighth-grade classrooms, two of which were chosen for the experimental treatment. This procedure seemed to ignore environmental conditions peculiar to each class and assumed homogeneity of subjects in each classroom. Furthermore it was not explained why college level questions were used in the criterion tests on grade eight students. The Paragraph Meaning Test was used as the pretest and four criterion tests were used as posttests. The rationale for not using equivalent tests was not given. Performance on the criterion tests was measured in terms of the number of questions answered, rather than in terms of correctness of the responses. No explanation was offered. In all fairness to Moore et al. their main interest was self-instruction technique and not the degree of test-sophistication.

An "Outline of Test-Wiseness Principles," (see Appendix C) a modified version of the one developed by Millman et al., (1965) was prepared. The pretests and posttests were equivalent forms and the performance of interest was the number of questions answered correctly. Wording of the framework was changed to be more suitable to grade nine students.



## CHAPTER II

### THE PROBLEM

The primary concern of this study was whether or not test-wiseness could be taught in the normal classroom set-up. If test-wiseness contributes significantly to the variation in test scores, and recent research seems to indicate that it does, then some sort of corrective action by teachers or the Department of Education or both is warranted. If test-wiseness is to be controlled, should it be done by assuring that all students become test-wise or that none of them gain this ability? According to Ebel (1965) "more error in measurement is likely to originate from students who have too little, rather than too much, skill in taking tests." It would appear to be much easier to control the behavior of teachers, parents and students in this regard by assuring that all students receive instruction in test-taking strategies. According to Ebel (1966), this would be the most effective solution.

A somewhat extensive body of research exists on the problem of the test-taking habits of individuals. Essentially there are four bases on which candidates respond to objective questions:

(a) Direct knowledge: The subject's response is based upon his information about the content of the question. Although his degree of certainty regarding the correctness of his answer varies widely, his selection is always "knowledge-based."

(b) Test-wiseness: The subject's response is based upon his knowledge of the design and format of objective tests.

(c) Response sets: The subject's response is based upon an ingrained set of personality habits which are independent both of his knowledge of the content of the question and of his test-wiseness.





(d) Chance guessing: The subject's response is a result of guessing.

Of these bases perhaps the least frequently used is the last. Despite this fact, the statistical formulas which have been devised to "correct" the scores of the candidate who arrives at a right answer on some basis other than knowledge, are based on the assumption that all wrong answers are due to chance guessing. This assumption has been seriously challenged. Little and Creaser (1966) state that "the basic assumption for the correction for errors scoring formula (that all wrong responses are pure guesses) penalizes the student by utilizing only those responses about which he feels certain." On the other hand, Cureton (1966), states that it is unethical not to use the scoring formula in any real-life testing situation unless the examinees are given time and explicit instruction to mark every item. No examinee should be allowed to increase the value of his test score by disobeying the examiner's instruction: Cureton goes on to say that the all-or-none assumption is incorrect and suggests that "his" correction for guessing formula should be used for all timed power tests. Many researchers would agree that the more competent examinees will most frequently be correct on their considered guesses, and a substantial amount of evidence exists to demonstrate that many students guess regardless of penalties and instruction warning them not to do so (Sherriffs and Boomer 1954, Swineford 1941 and Swineford and Miller 1953). This finding along with others has led the Alberta Department of Education and publishers of standardized tests to abandon "do not guess" instructions on their tests.

Other research on the test taking habits of individuals has been conducted. At least two studies, Briggs and Johnson (1942), and Reile





and Briggs (1952) have demonstrated that, contrary to popular belief students generally increase rather than decrease their test scores when they reconsider and revise their original answers. Briggs and Johnson (1942) compared the scores of the third of the students finishing a test first with the scores of the third finishing last. They found that the highest scores were made by these two groups and concluded that whereas the early finishing students obtained their scores through superior intelligence, the late finishers obtained theirs through persistence. It is probable that these careful and persistent late finishers are the ones who go back and revise their original answers, causing the score increases. The results of Broen and Wirt's (1958) study corroborates those of other studies up to that time that show that test results are determined in part by tendencies to respond to items in certain ways regardless of the specific content of those items. However in the studies done solely on multiple-choice questions by Case (1964) and Wilbur (1967) no evidence was found of the existence of a position, or length of option response set. Therefore multiple-choice examinations are relatively free of response bias.

An important source of variation in test scores is test-wiseness. Considerable research has been done on the effects of practice and coaching in Great Britain where more emphasis is placed on test scores for predicting academic achievements than is done in Canada. Studies by Wiseman (1954), Vernon (1954), Peel (1951) and Peel (1952) showed that the effects of practice and coaching does make a difference. Peel (1951) gave 1,239 boys and girls three intelligence tests at monthly intervals with no coaching in between. The main effect took place substantially between the first two testings. Also the practice effect is more marked with more able children, reaching a maximum in the region of I.Q. 125



(Peel 1951). Vernon (1954) found that a few hours of coaching produced the maximum achievable average gains; hence any larger amount is not only undesirable but futile. The gain is about 9 I.Q. points. Frankel (1960) working with college students in the United States found that the coached group outscored the uncoached group by about eight points on the Scholastic Ability Tests - Verbal, and nine points on the Scholastic Ability Tests - Numerical, no value being statistically significant. These findings are in agreement with previous studies done by Anastasi (1958) and others dealing with the effects of coaching on SAT scores. According to Wiseman (1954) it is the practice element in the coaching which produces the observed gains. It appears, from the above discussion, that coaching as such is not very effective, consequently this study dealt only with the effects of teaching test-taking strategies.

#### Value of the study

If there is significant variation in test scores attributable to test sophistication then test-taking strategies should be included as a regular part of the curriculum. Teaching test-wisness to all grade nine students would insure that fewer variables and more content will be measured by the grade nine final examinations. If there are no differences due to test-sophistication, then rural teachers, if indeed rural students are non test-wise, can rest assured that their students are being assessed fairly by Departmental Examinations.

#### Definitions

Test-wisness. Throughout the report of this investigation, the term test-wisness shall be the interpretation given by Millman, Bishop and Ebel (1965).



.....a subjects' capacity to utilize the characteristics and formats of the test and/or the test taking situation to receive a high score. Test-wiseness is logically independent of the examinee's knowledge of the subject matter for which the items are supposedly measured...will exclude factors concerned with the general mental attitude (such as anxiety and confidence) and motivational state of the examinee, and it will be restricted to the actual taking of (not preparing for) objective achievement and aptitude test.

Urban student. An urban student is one attending an urban school.

Urban school. An urban school is one located within the boundaries of an incorporated city in Alberta. A city, as defined by the Government of Alberta, Department of Municipal Affairs (1952), must have a population in excess of 6,000 and it must have not less than six or more than twenty aldermen, of an even number (usually 8 or 10 in practice).

Rural student. A student attending a school in Alberta which is not an urban school is considered a rural student.





## CHAPTER III

### DESIGN

#### Hypothesis

In order to investigate the effects of teaching test-wiseness the following general hypothesis, stated here in null form, was tested:

Beyond the effects of general intellectual ability, students receiving instructions on test-taking strategies in a normal classroom situation do not score differently on an objective post-treatment test than students who did not receive this instruction. This general hypothesis was tested by considering several specific hypotheses.

#### Sample

The subjects were 202 ninth grade students, 117 of whom were enrolled in two urban junior high schools and the remaining 85 in two rural junior high schools. In each school the names of the boys were separated from the names of the girls and then each name was assigned a number. The boys' numbers were selected at random from a hat separately from those of the girls. Each sex was divided into six equal groups by drawing numbers from a hat, after which the girls were grouped with the boys making a total of six equal groups. Two of these six groups were experimental groups, two were control groups and two were placebo groups. It was necessary for testing purposes, as will be explained later, that two groups form one type of group. That is, the Experimental A group and the Experimental B group formed the experimental group. The Control A group and the Control B group formed the control group and the Placebo A group and the Placebo B group formed the placebo group.





## Materials

In all there were four multiple-choice achievement tests used; two were used as the pretests and two were used as the posttests. Each test consisted of 54 multiple-choice items which were selected from previous Grade Nine Social Studies Departmental Examinations from the years 1961 to 1965. There were 108 questions covering sections one and three of the outline in the Junior High School Curriculum Guide. Sections one and three were chosen to be tested as these sections had all been covered through normal classroom instruction by all of the schools involved with the study. Each item was assigned a number and 54 of the available 108 items were selected at random from a hat to make up Test No. 1 (see Appendix A) which was used as the pretest for the A groups (Experimental A group, Control A group and the Placebo A group). The remaining 54 items made up Test No. 3 (see Appendix A) which was used as the posttest for the B groups (Experimental B group, Control B group and the Placebo B group). The included items which had been selected from Grade Nine Departmental Examinations were constructed by test experts chosen by the Department of Education. Next, the items in Test No. 1 were deliberately changed to break existing rules in good test making, (see Appendix B for rules), to form Test No. 2, (see Appendix A), which was used as the pretest for the B groups. The items of Test No. 3 were similarly changed to make Test No. 4 (see Appendix A), which was used as the posttest for the A groups. In this way, there were two good tests, Tests No. 1 and No. 3, and two tests composed of poorly constructed items, Tests No. 2 and No. 4.

General verbal intelligence was measured by the "Verbal Reasoning Test" of the Differential Aptitude Tests. By using the obtained scores it was possible to insure that the six groups were not significantly



different from one another in general ability.

A modified version of the "Outline of Test-Wiseness Principles," developed by Millman et al; (1966) was prepared (see Appendix C). The language level used and the relevance of the principles for the sample used in this study were the main consideration in the modification of the outline. An "Elaboration of Selected Principles" was also prepared to facilitate instruction of the principles to grade nine students (see Appendix C).

General statistics concerning the instrument. In his discussions of validity Lindvall (1967) states that any procedure for obtaining information about students is valid to the extent that it actually provides the desired information. In the evaluation of pupil achievement, the information desired is the degree to which pupils have achieved the specified instructional objective. Validity is of course the most important quality to be sought in an evaluation procedure, for if that procedure does not provide the information sought, it will be of little value. The validity of the social studies achievement tests used in this project was not of major concern in determining the results. Whether or not the tests were actually measuring knowledge of social studies content as such was not of vital concern. This study was concerned only with the error variance produced by test-wiseness. Although validity wasn't important, reliability of the tests was of mild interest. Although reliability, as well as validity, was assumed because the items were constructed by test experts, it was of interest to see how "good" these items really were. From the summary of reliability given in TABLE I the tests were judged to be adequately reliable for their purpose.



TABLE I

## KR-20 RELIABILITIES OF ACHIEVEMENT TESTS

<u>TEST</u>	<u>RELIABILITY</u>
Test No. 1	0.75
Test No. 2	0.81
Test No. 3	0.83
Test No. 4	0.78

Ebel (1965) says that there is a close relationship between the difficulty of a test item and its contribution to test reliability. A summary of the levels of difficulty appear in Appendix E. There does not appear to be any difference in level of difficulty amongst the tests.

It is of interest to note that a few of the items were unsatisfactory as indicated by their biserial correlations. Item nine of Test No. 1 (bis. cor. = -0.038) and item thirty-nine of Test No. 2 (bis. cor. = -0.128) were miskeyed and consequently had a negative biserial correlation. As both of these tests were used as pretests and intelligence was divided equally amongst the six groups it was felt by the writer that this did not affect the statistics of the results significantly.

#### Procedure

The following format is an itinerary of the day's activities in each of the schools visited. It was necessary to spend only one day in each school to complete the tests and give the instruction.

9:00 A.M.	All grade nine students wrote the pretests and the Verbal Reasoning Test of the D.A.T. Forty minutes of writing
to	
10:20 A.M.	time was allowed for the pretest and thirty minutes for the D.A.T. test.





10:20 A.M. Normal classroom instruction with the exclusion of any  
to Social Studies class.  
Noon

Noon

1:00 P.M. Registration was completed. The three types of groups  
to were separated into different rooms for instructional  
1:05 P.M. purposes.

	<u>Experimental Groups</u>	<u>Placebo Groups</u>	<u>Control Groups</u>
1:05 P.M. to 1:30 P.M.	The students were given an outline of test-wiseness principles (see Appendix C), with which to follow the instructions. Instruction on test-taking strategies was then given using the prepared handout "Elaboration of Selected Principles" (see Appendix C), as a guide. During the first session with this group PART I, "Elements Independent of Test Construction or Test Purposes," was covered.	This group was allowed to read vocational information which had been made available to them.	For the remainder of the afternoon and up until the time they wrote the post treatment tests this group was allowed to do any type of normal school work, except Social Studies. Also, the teachers were asked not to discuss with the students what was happening in the other classes.
1:30 P.M. to 1:57 P.M.	During this 25 minutes the students were asked to do further study on PART I of the "Elaboration of Selected Principles". Their instructions were to read PART I of the handout twice, using the last 5 minutes at the end of this period for review. They were not allowed to ask any questions of the supervisor.	The same experimenter who worked with the experimental groups gave these placebo groups a 25 minute talk on the importance of school training for future vocational decisions.	





	<u>Experimental Groups</u>	<u>Placebo Groups</u>	<u>Control Groups</u>
1:57 P.M. to 2:00 P.M.	Both groups were given a break but were asked not to communicate with students from the other groups if they met in the hall. Generally, the students observed this request.		
2:00 P.M. to 2:25 P.M.	The remainder of the test-taking strategies which are listed under PART II in the "Outline of Test-Wiseness Principles," were discussed.	This group was again given vocational information and encouraged to read in an area of their interest.	
2:25 P.M. to 2:50 P.M.	The group studied PART II of the "Elaboration of Selected Principles" in the same manner as they had done for PART I.	The experimenter continued his talk on the need for education in vocational choice.	
2:52 P.M. to 3:35 P.M.	All groups were returned to their original classrooms to write the post treatment tests. Care was taken that those students who wrote pretest Test No. 1, wrote the posttest Test No. 4 and those who wrote pretest Test No. 2 wrote posttest Test No. 3.		

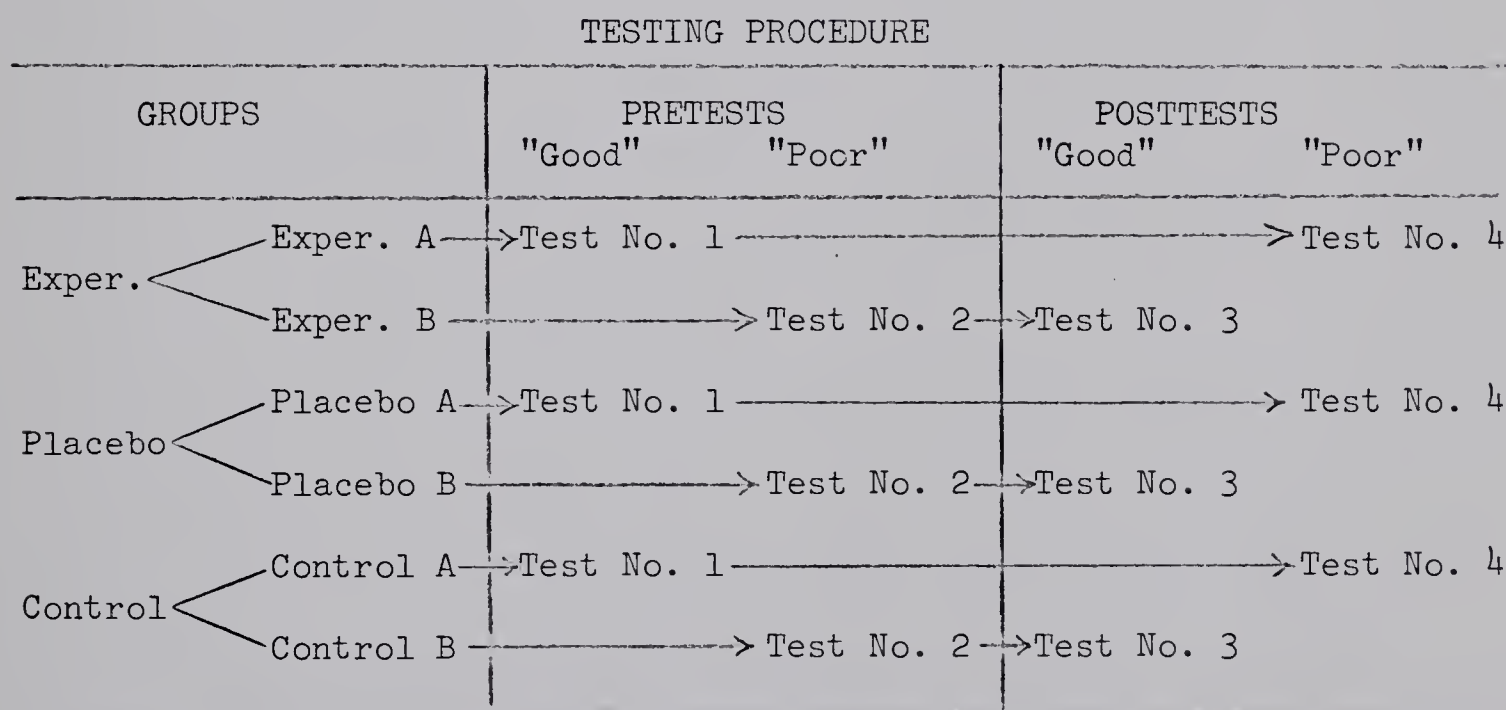
Some minor adjustments were necessary on the starting and thereby the completion times, because of a particular school's time table. However, in general the above format was followed in each of the four schools visited. Three classrooms in each school were used all afternoon with each group occupying one of them. The groups did not move, rather it was the experimenter and one of the supervisors that moved from room to room during the afternoon. The experimenter took pains to see that he spent as much time working with the placebo groups as he did with the experimental groups. None of the students were told which group they belonged to prior to the investigation.

The Experimental A group took the pre-experimental achievement test, Test No. 1, which is composed of well constructed multiple-choice



test items, as prepared by test experts selected by the Department of Education of Alberta. The Experimental B group, took an equivalent pre-experimental achievement test, however the test items had been altered to break existing rules in good test making. The Control A group and the Placebo A group took the same pre-experimental "good" test as did the Experimental A group. Also, the Control B group and the Placebo B group took the same pre-experimental "poor" test as did the Experimental B group. The posttests had a similar arrangement, the A groups took the "poor" multiple-choice test, Test No. 4, with the altered items and the B groups answered the well constructed test items of Test No. 3. The following diagram may clarify the procedure.

FIGURE I



#### Statistical design

The means and standard deviations for all six groups were calculated from the results of the pretest and again from the results of the posttests. Correlated t-tests for all groups were used to test whether pretest scores or posttest scores differed statistically from one another. In order to show any change in score in each group from pre-



treatment achievement to post-treatment achievement, independent t-tests were used for all groups. An analysis of variance was carried out on the D.A.T. results to check for any pre-experimental difference in mean intelligence between the six groups.

A basic assumption of the t-test is equality of the population variances. An F test was carried out to determine if there was any differences between these variances, and differences were found. The ordinary t-tests were therefore not sufficient, and consequently Welch T Prime Tests were used to get modified t's which take into consideration the differences in variances by changing the degrees of freedom. In all cases the results of the rural sample were analyzed in the same way, but separately from those of the urban sample.





## CHAPTER IV

### RESULTS

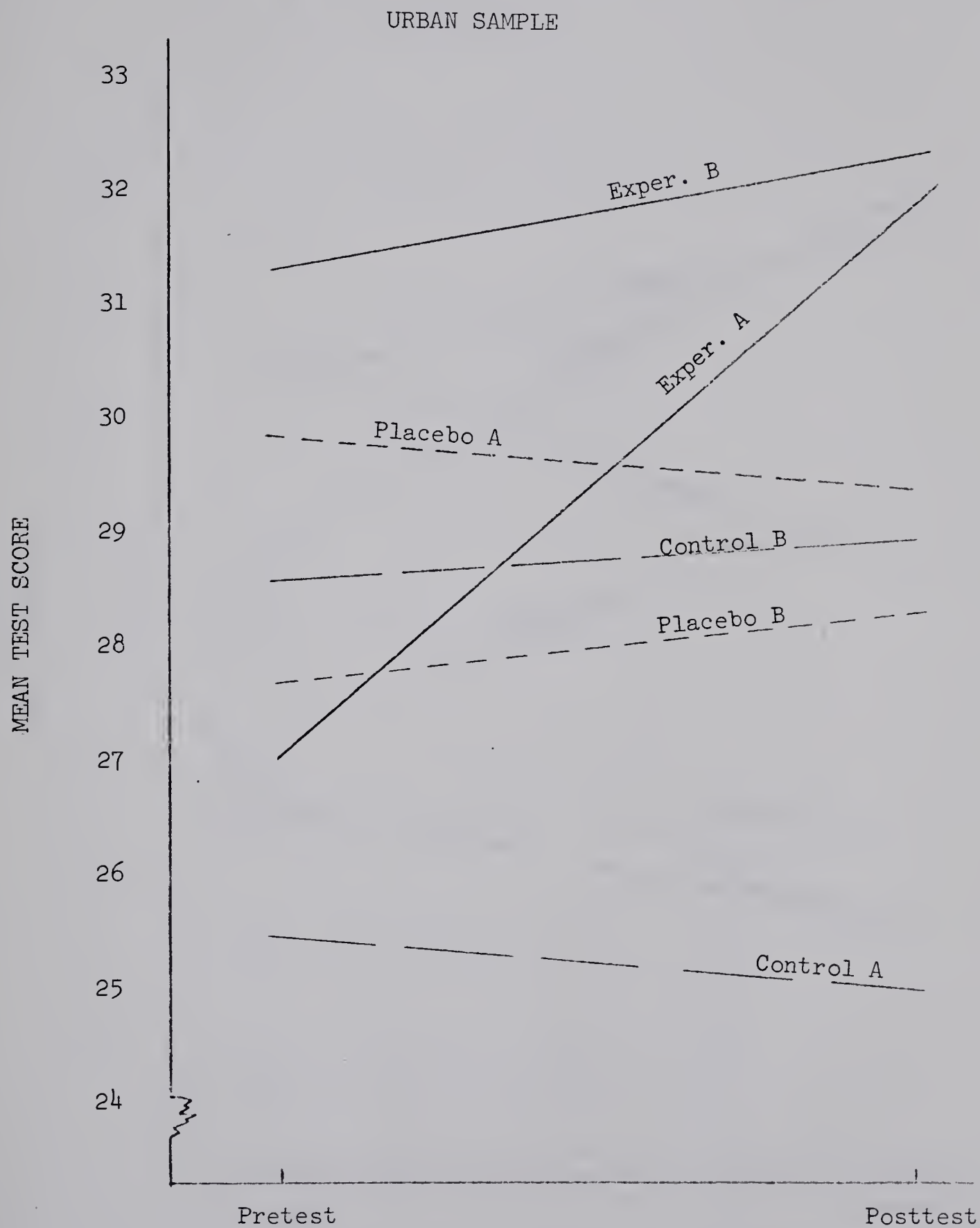
To facilitate the reader's interpretation of the results of the four Social Studies achievement tests, diagrams of the mean scores were placed on Figure II and III which appear on the following two pages. Because the mean scores for the urban sample were higher than the mean scores of the rural samples, they were treated as two separate samples and analysed independently. The reader should note that the vertical scale was exaggerated in order to make differences or changes in scores more apparent. A solid line connects the means of the pretests to the means of the posttests for the experimental groups A and B. The means of the pretests and the means of the posttests for the control groups are connected by a long dashed line. Finally, the means of the pretests of the placebo groups are connected to the means of the posttests of the placebo groups by a short dashed line. These lines should enable the reader to see more readily any changes in score from the pretest scores to the posttreatment test scores. Tables II and III show that only the Experimental A groups in both rural and urban samples showed a significant change in their mean scores. This is also illustrated in Figures II and III. These scores indicate that the treatment given these groups actually made a difference. Although the change in score for the Experimental B groups was not significant, it is worthwhile to note that in both the rural and the urban samples it is in the positive direction. More will be said about this phenomenon in the next chapter under "Discussion."

In order to test whether the six groups involved differed significantly on the pretest scores and on the posttest scores,





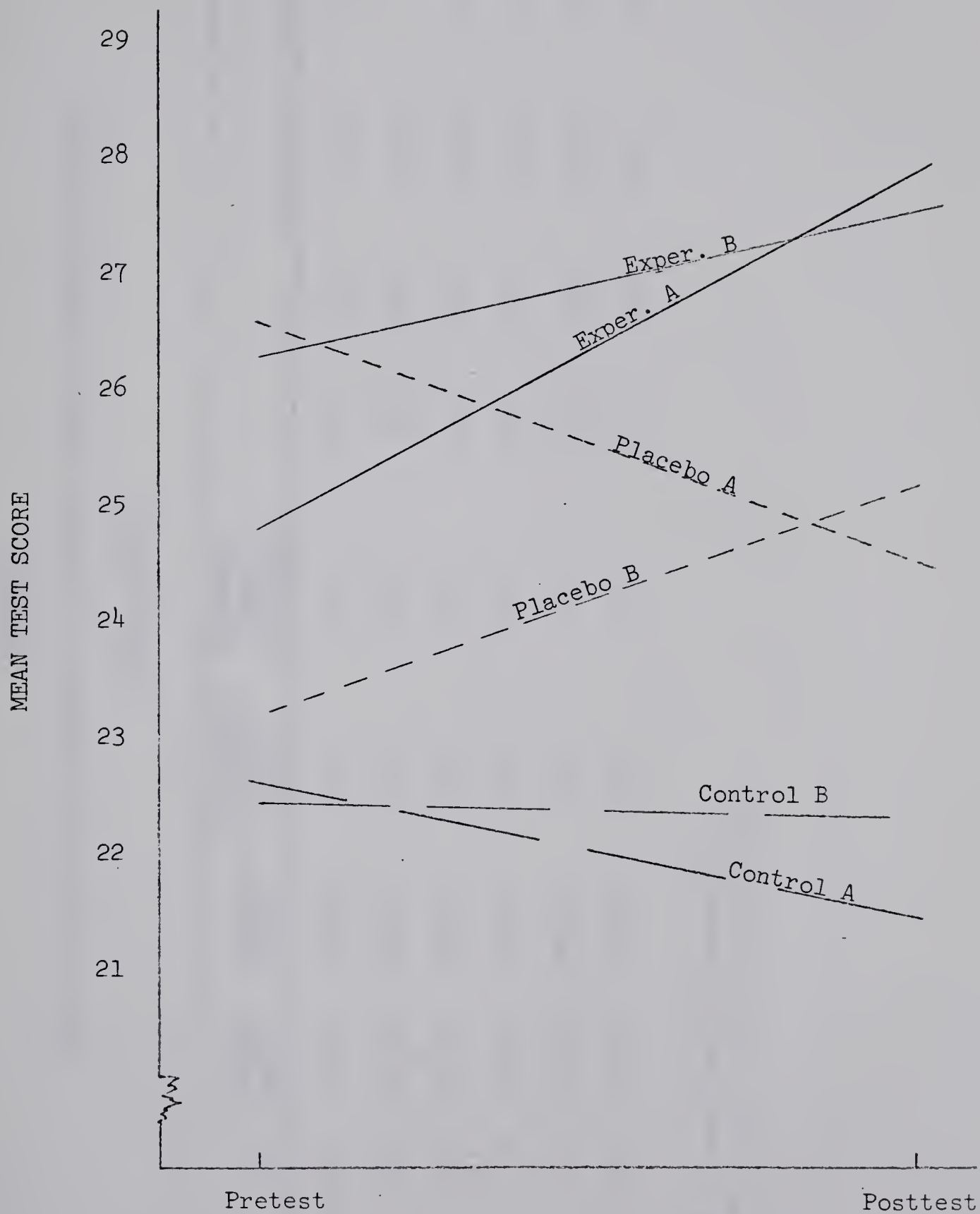
FIGURE II  
PRETEST AND POSTTEST RESULTS



Note: The vertical scale has been exaggerated in order that the changes in score are more evident.



FIGURE III  
PRETEST AND POSTTEST RESULTS  
RURAL SAMPLE



Note: The vertical scale has been exaggerated in order that the changes in score are more evident.



TABLE II  
TESTS OF SIGNIFICANT CHANGE FROM PRETEST SCORES TO POSTTEST SCORES

RURAL SAMPLE

GROUP	N	PRETEST MEAN	POSTTEST MEAN	DIFFERENCE BETWEEN MEANS		STANDARD ERROR DIFFERENCE	t	DF	PROBABILITY	SIGNIFICANCE
Control A	13	22.69	21.69	-1.00		1.11	-0.90	12.00	0.39	NS
Exper. A	15	24.93	28.07	-3.14		1.18	2.65	14.00	0.02	S
Placebo A	15	26.67	24.73	-1.93		1.46	-1.32	14.00	0.21	NS
Control B	14	22.57	22.50	-0.07		1.11	-0.06	13.00	0.95	NS
Exper. B	14	26.36	27.79	1.43		1.35	1.06	13.00	0.31	NS
Placebo B	14	23.29	25.36	2.07		1.30	1.59	13.00	0.14	NS

Note: S - less than 5% probability.  
NS - greater than 5% probability.



TABLE III

## TEST OF SIGNIFICANT CHANGE FROM PRETEST SCORES TO POSTTEST SCORES

## URBAN SAMPLE

GROUP	N	PRETEST MEAN	POSTTEST MEAN	DIFFERENCE		t	DF	PROBABILITY	SIGNIFICANCE
				BETWEEN MEANS	STANDARD ERROR DIFFERENCE				
Control A	20	25.45	25.95	0.50	1.93	0.26	19.00	0.80	NS
Exper. A	20	26.95	32.00	5.05	1.25	4.03	19.00	0.00	VS
Placebo A	19	29.89	29.32	-0.58	0.77	-0.75	18.00	0.46	NS
Control B	19	28.58	28.84	0.26	0.95	0.28	18.00	0.78	NS
Exper. B	21	31.29	32.33	1.05	0.77	1.35	20.00	0.19	NS
Placebo B	18	27.67	28.28	0.61	1.38	0.44	17.00	0.66	NS

Note: VS - less than 1% probability.

S - less than 5% probability.

NS - greater than 5% probability.





correlated t-tests were carried out between all pairs of groups. The results of these tests were reported in Table IV and Table V. There were no significant differences found between any pairs of means in the pretest results. However, in the posttreatment scores there was a significant difference between the Control A groups and the Experimental A groups. Both the urban sample and the rural sample show this difference.

The results of the control groups tests did not show any change from pretest to posttest scores. (This behavior could have been predicted and wasn't at all unexpected.) The scores of the Placebo A groups however, although they did not change significantly, did reveal some peculiarities. In the urban, and in particular the rural sample, the mean of the Placebo A group decreased where it might be expected to increase. Influences, such as that of the practice effect (Peel, 1951) the Hawthorne effect (Brown, 1964) should have inflated the score. Besides these effects the students wrote a test containing "good" multiple-choice items as the pretest and a test containing "poorly" constructed items as the posttest. Considering these effects it should be predicted that the posttest scores would be higher than the pretest scores, however this was not the case.

With few exceptions the results of the rural sample agreed very closely with those of the urban sample. The spread in scores and the changes in mean scores were similar in both samples. The only real difference was that the rural sample started and ended with lower mean scores than those of the urban sample. Not only did the urban students in the experimental A groups start at a higher mean, their increase was greater than that of the rural students in the Experimental



TABLE IV

TEST OF SIGNIFICANCE FOR DIFFERENCES BETWEEN THE MEANS OF THE PRETESTS SCORES AND ALSO FOR DIFFERENCES BETWEEN THE MEANS OF THE POST-TREATMENT TEST SCORES OF THE URBAN SAMPLE

GROUP 1	GROUP 2	MEAN 1	MEAN 2	ST. DEV 1	ST. DEV 2	DF	t	PROBABILITY	SIGNIFICANCE
PRETEST									
Control B	Exper. B	28.58	31.29	7.87	8.71	38	1.001	0.3231	NS
Control B	Placebo B	28.58	27.67	7.87	6.85	35	0.365	0.7173	NS
Exper. B	Placebo B	31.29	27.67	8.71	6.85	37	1.388	0.1735	NS
Control A	Exper. A	25.45	26.95	7.72	6.17	38	0.662	0.5121	NS
Control A	Placebo A	25.45	29.89	7.72	6.30	37	1.914	0.0634	NS
Exper. A	Placebo A	26.95	29.89	6.17	6.30	37	1.437	0.1592	NS
POSTTEST									
Control A	Exper. A	25.95	32.00	9.09	7.19	38	2.276	0.0286	S
Control A	Placebo A	25.95	29.32	9.09	6.32	37	1.302	0.2009	NS
Exper. A	Placebo A	32.00	29.32	7.19	6.32	37	1.204	0.2363	NS
Control B	Exper. B	28.84	32.33	7.08	7.37	38	1.486	0.1456	NS
Control B	Placebo B	28.84	28.28	7.08	8.72	35	0.211	0.8344	NS
Exper. B	Placebo B	32.33	28.28	7.37	8.72	37	1.533	0.1338	NS



TABLE V

TEST OF SIGNIFICANCE FOR DIFFERENCES BETWEEN THE MEANS OF THE PRETESTS SCORES AND ALSO FOR DIFFERENCES BETWEEN THE MEANS OF THE POST-TREATMENT TEST SCORES OF THE RURAL SAMPLE

GROUP 1	GROUP 2	MEAN 1	MEAN 2	ST. DEV 1	ST. DEV 2	DF	t	PROBABILITY	SIGNIFICANCE
PRETEST									
Control B	Exper. B	22.57	26.36	4.66	5.86	26	1.823	0.0798	NS
Control B	Placebo B	22.57	23.29	4.66	7.46	26	0.293	0.7719	NS
Exper. B	Placebo B	26.36	23.29	5.86	7.46	26	1.167	0.2537	NS
Control A	Exper. A	22.69	24.93	4.79	6.99	26	0.939	0.3564	NS
Control A	Placebo A	22.69	26.67	4.79	6.79	26	1.700	0.1011	NS
Exper. A	Placebo A	24.93	26.67	6.99	6.79	28	0.666	0.5111	NS
POSTTEST									
Control A	Exper. A	21.69	28.07	3.97	6.14	26	3.092	0.0047	VS
Control A	Placebo A	21.69	24.73	3.97	6.53	26	1.409	0.1707	NS
Exper. A	Placebo A	28.07	24.73	6.14	6.53	28	1.392	0.1748	NS
Control B	Exper. B	22.50	27.79	6.83	7.17	26	1.924	0.0654	NS
Control B	Placebo B	22.50	25.36	6.83	7.39	26	1.023	0.3156	NS
Exper. B	Placebo B	27.79	25.36	7.17	7.39	26	0.850	0.4031	NS







A groups.

Their verbal ability as measured by the Verbal Reasoning Test of the Differential Aptitude Tests shows the rural sample with a mean raw score of 19.165 and the urban sample with a mean raw score of 22.410. To determine whether or not any of the original six groups in each sample showed a significantly different score from the other groups in verbal ability an analysis of variance was carried out with the verbal reasoning results. Tables VI and VII showed no significant differences among the groups in verbal ability within each sample.

TABLE VI

ANALYSIS OF VARIANCE  
RURAL SAMPLE

SOURCE	SUM OF SQUARES	MEAN SQUARES	DF	F	PROBABILITY
Groups	464.98	93.00	5	1.48	0.20
Error	4954.71	62.72	79		

TABLE VII

ANALYSIS OF VARIANCE  
URBAN SAMPLE

SOURCE	SUM OF SQUARES	MEAN SQUARES	DF	F	PROBABILITY
Groups	297.73	59.55	5	0.65	0.66
Error	10218.58	92.06	111		



Although t-tests were carried out to determine if there were any differences in scores between the different groups, both on the pretest means and on the posttest means this quite often is not sufficient. A t-test assumes equality of the population variances. Where the assumption of equality of variance is untenable, the ordinary t-test should not be used. An approximate method which could be used has been devised by Welch (Ferguson, 1966). The method proposed by Welch makes an adjustment in the number of degrees of freedom. In order to determine first of all whether there were any differences between variances an F test was carried out between the variances of each group (see Appendix D, Table I & II). In a few cases it was found that the samples compared were different at the .05 level, consequently the Welch T Prime test was used to get a more refined value for the t-test. (See Appendix D, Tables III and IV). These tests were of interest only once. It was discovered there was a difference between the variances of the Control A group and the Experimental A group in the rural sample. The significant probability is shown in Table VIII. The original t-test had shown a significant difference between these two means. To determine whether there really was a difference between these scores it was necessary to look at the results of the Welch T Prime test which is shown in Table IX. The probability indicates a highly significant difference between these two means which substantiates the findings of the original t-test.



TABLE VIII

DIFFERENCES BETWEEN VARIANCES IN THE POSTTEST OF THE  
RURAL SAMPLE

GROUP 1	GROUP 2	VAR. 1	VAR. 2	DF 1	DF 2	F	PROBABILITY
Control A	Exper. A	15.75	37.66	12	14	2.391	0.0306

TABLE IX

WELCH T PRIME APPROXIMATION ON VARIABLES MENTIONED IN  
TABLE VIII

VARIABLE	DF	T PRIME	PROBABILITY
1	24.20	3.30	0.0011

The results of the t-tests and the modified t-tests as determined by the Welch T Prime tests have shown a definite change by the Experimental A Groups from the pretest scores to the posttest scores, and there is also a difference between the Control A Scores and the Experimental A Scores on the posttest results in both the rural and the urban sample. Therefore, the null hypothesis which was stated in Chapter III was rejected where students write a poorly constructed test. That is, after receiving instructions in test-taking strategies for one half day, students do score higher on poorly constructed tests. This indicates that test-wiseness can be taught in the normal classroom situation. Finally, there are some indications that test-wiseness has an effect on the results of tests composed of well constructed items.





## CHAPTER V

### FINDINGS AND DISCUSSION

#### Findings

It is safe to assume that in the five years previous to this study the students involved in it had been exposed to multiple-choice items on numerous occasions. Studies by Wiseman (1954), Vernon (1954), Peel (1951) and Peel (1952) showed that practice with standardized tests produces a difference. In order to determine the extent of existing test sophistication in the students used in this study, two types of pre-experimental tests were used. As was previously explained, one of the pre-experimental tests consisted of items composed of well constructed multiple-choice items and the other was composed of poorly constructed items. The "good" test should have reduced to a minimum any inflation of score due to previous knowledge of test-taking strategies. On the other hand, students who were previously sophisticated in test taking strategies should have inflated their pretest scores when they wrote the "poor" pretest. Results of the independent t-test showed however, (Tables IV and V) that there was no significant differences between any of the groups' pretest means in either the rural or the urban samples. Therefore, it could be assumed that the amount of test-taking strategies familiar to the students previous to this study were not sufficient to make a difference on even a poorly constructed test. Therefore all of the groups started at the same level of test-sophistication and results of the analysis of variance on the D.A.T. scores indicate there was no difference in general ability between the groups, consequently, any increase in scores as measured by the posttests





should be the result of the treatments given. Having used a "pocr" test and a "good" test as well for the posttests, the experimenter was able to discern on what type of examination the treatment had an effect, if any.

Although the results of the "poor" posttests were magnified somewhat, because the students were first taught how to recognize common faults in test items and then were administered a test containing poorly constructed items, only the Experimental A groups showed the anticipated gain. The Experimental B groups wrote the "good" posttest and did not show any significant change. It would appear therefore, that the better the test the less effect test-wiseness will have on the results.

### Discussion

It may seem possible to construct a test which could assess achievement without the error variance associated with test-wiseness. However, before this assumption is made it would do well to note that although the Experimental B groups did not increase their mean scores significantly, they did increase their scores. This occurred in both the rural and the urban samples. Metfessel and Say (1958) state that a number of standardized tests have biases in their keying patterns. If this is true then test-wise students should be able to inflate their results even on well constructed multiple-choice tests and the results of this study seem to support this view.

Another interesting behavior was that of the Placebo groups. Due to influences which have been previously mentioned, such as the Hawthorne effect (Brown 1964), and the practice effect (Peel 1951), the post-treatment scores should have been inflated. Observation of



Figures II and III indicate that this was not the case. The Placebo A groups actually decreased their score. This peculiar behavior could possibly be explained by the following frustration factor which probably was not present in the experimental and control groups. After the placebo groups had written their pretests they were subjected to lectures and vocational information that did not appear to them to have any relation to what had gone on that morning. Questions such as the following were asked. "What's all this got to do with the tests we took this morning? Why can't you tell us what is going on? What are the other groups doing?" Besides this there was the fact that a visiting teacher was in the class and they must have felt that he was there to do something different with them. Certainly this created an atmosphere of expectation amongst the students. Although they were given an equal amount of attention as the experimental groups the students in the placebo groups probably noticed this apparent lack of direction. Meanwhile, the experimental groups knew exactly what was happening and why. The control groups, on the other hand, were unconcerned because they were following their regular afternoon classes.

### Limitations

In order for the results to have been more convincing than they were, it would have been better had there been a real difference between the posttest results of the Experimental B groups and the control groups.

The random sampling for the cells was difficult, particularly in the rural sample, because of the small number of students in each cell. To compensate for this lack of numbers in each cell it may have been wise to analyze the rural and urban samples as a unit, however, because of the difference found in general ability as measured by the "Verbal





Reasoning Test" of the Differential Aptitude Tests this was not feasible.

No attempt was made in this study to analyse the difference, if any, due to the sex of the individual. This difference would have been difficult to discover with the present sampling because of the small sample size. If the rural and urban samples had been considered as a unit then the sex differences could have been analysed.

No consideration was given, in this study, to the possible effects of a time lapse on the skills learned in the test-wiseness instruction period. A study by French (1959) indicated that coaching is effective for a few weeks or months but not for as long as two or three years. A natural follow-up to this present study on test-wiseness would have been to use the results of the grade nine Departmental Examinations which came out five months after this study was completed, and to compare the groups on these.

### Implications

What value is this study to the normal classroom teacher and his students? In the past it has been widely accepted by many educators that students who were test-wise would score higher on achievement tests. However very little research was done in the past on test-wiseness, and particularly its effects on the results of objective tests. But like many other assumptions, teachers continued to teach test-taking strategies without ever having proven their effectiveness. Hopefully, this study will renew their efforts and encourage others who have been dissenters to re-evaluate their positions and incorporate test-taking strategies into their regular curriculum. Also it is hoped that rural students will be given the opportunity to become test-wise in order that they will be able to compete more favourably





with their more test competent counterparts from urban areas. The intention of this study was not to raise scores as such, but to remove some of the variables existing in our present method of evaluating grade nine students in Alberta. It has already been stated by Ebel (1965) that it is those students with little test-taking knowledge that are most likely to cause errors in measurement. Therefore it would seem reasonable, in order to remove some of this error variance, that all students be assured an opportunity to become test-wise.

To control the error variance due to practice and coaching, Wiseman (1954) suggests a programme for "test-experience" which would allow the children to work the tests under standard conditions. Similar standard conditions could be set up for the teaching of test-wiseness. If this is done in the period immediately preceding the final examinations it is likely to swamp any gains which may have been produced by the unofficial instruction of some of the children.

Insuring that all students receive instructions in test taking strategies will not remove all error variance in achievement, nor will this instruction come about immediately, consequently it is advisable that less reliance be placed by authorities in making their allocations to senior high schools on one set of examination papers. Other sources could be used instead, such as the use of a series of tests, the employment of teachers' estimates of their pupils abilities, the introduction of additional methods of differentiating between the educational needs and potentialities particularly of those children who occupy the border zone in examination lists.

Further research is needed to help answer some of the following questions. What is the optimal length of time needed to teach test-wiseness? At what grade should this instruction begin? Does the



knowledge of test-taking strategies in Social Studies have any carry-over value to other courses such as Mathematics or Science? What is the effect of intelligence on the ability to learn and use these strategies? How can test makers construct test items which are relatively free of the effects of test-wiseness? Were the test-strategies used the best available?

The teacher in the classroom is not primarily interested in averages. He is concerned with individual children and the effect of this type of instruction on their separate performances. Average gains made by the experimental groups may have concealed wide variation in individual scores. Research results would be more useful to teachers if analyses of individual children's results were included in addition to average scores for classes or groups. A teacher is faced with the situation that if he tries to instruct in this way, it may well be that some borderline children will do less well at the end of the instruction period. The control groups as well as the placebo groups also showed this kind of variation in individual gains. It would be valuable if this variation were considered in future investigations of this type.



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## A P P E N D I X    A

### Social Studies Achievement Tests



GRADE IX SOCIAL STUDIES ACHIEVEMENT TEST - Test No. 1

1. As one descends in altitude from 3300 feet to 2800 feet the surrounding air normally
  - A. decreases in temperature and increases in density
  - B. becomes more moist and less dense
  - C. increases in density and increases in temperature
  - D. increases in density and decreases in temperature
2. The standard of living of a group of people refers to the
  - A. satisfaction of that group's basic needs
  - B. supply of natural resources
  - C. satisfaction of that group's wants
  - D. satisfaction of that group's artistic needs
3. During which of our seasons do the North-East Winds blow south of the geographic equator?
  - A. summer
  - B. spring
  - C. autumn
  - D. winter
4. Warm and cold currents affecting the Western Hemisphere are the
  - A. North Pacific Drift and the Labrador Current
  - B. Japanese Current and the North Pacific Drift
  - C. Peru Current and the Labrador Current
  - D. Brazil Current and the North Pacific Drift
5. A continental type climate would usually be found
  - A. near the coastline of the larger continents
  - B. in the interior of the larger continental areas
  - C. near the extreme northern fringe of Eurasia and North America
  - D. near interiors of the equatorial continental areas
6. A map projection having radiating meridians and curved parallels which depicts the northern and southern extremities of the world is the
  - A. Homolosine projection
  - B. Homolographic projection
  - C. Mercator projection
  - D. Polar projection
7. The captital city of Equador is
  - A. Asuncion
  - B. Quito .
  - C. La Pas
  - D. Valpariso





8. The literary level of most of the Latin American states is quite low, a fact attributed for the most part to
- A. a general disinterest of Latin America in education
  - B. a lack of plentiful natural resources
  - C. climate varieties which do not promote an active population
  - D. a lack of governmental leadership in this area
9. The poor transportation system in Latin America suffers least as a result of the
- A. lack of a continuous effort by governments to improve the facilities
  - B. lack of a general interest in improved transportation
  - C. lack of sufficient capital to carry out improvements
  - D. rugged terrain and tremendous distances required to be covered
10. Low latitude deserts are generally caused by
- A. the excess of evaporation rates over precipitation rates
  - B. lack of surrounding bodies of water
  - C. the presence of low pressure areas over these deserts
  - D. the absence of winds
11. The tundra region receives little precipitation because
- A. cold air contains little moisture
  - B. it is too cold to rain in this area
  - C. winds tend to blow from the warmer areas
  - D. this is an area of low pressure
12. Soils in the tropical rain forest regions are
- A. highly fertile because of the abundance of vegetation
  - B. of an alkaline nature because of the high rate of evaporation
  - C. generally lacking in humus or dead plant materials
  - D. lacking in minerals necessary for good crop growth due to leaching by heavy rains
13. Monsoon climatic regions usually
- A. are found in the warm, humid continental regions
  - B. have periods of excessively high rainfalls followed by long dry periods
  - C. have a continuous low pressure area associated with them
  - D. do not support the growth of heavy vegetation and are sparsely populated
14. The most successful industrial nation in Latin America is
- A. Chile
  - B. Mexico
  - C. Brazil
  - D. Colombia



15. Which of the four western provinces is going ahead successfully in the development of potassium reserves?
- A. Alberta
  - B. Manitoba
  - C. Saskatchewan
  - D. British Columbia
16. Which of the following Indian tribes was most nomadic in their habits?
- A. Crees
  - B. Iroquois
  - C. Mayans
  - D. Toltecs
17. Which of the following developed the highest form of civilization?
- A. Chimus
  - B. Incas
  - C. Araucanians
  - D. Sioux
18. With one exception the statements below were reasons for the development of the Age of Exploration and Discovery. The exception is that
- A. the improvement in navigational science permitted longer voyage of ships out of sight of land
  - B. overland trade routes became blocked by the followers of Mohammed.
  - C. the Crusades developed new understandings of other parts of the world and also created new wants by western man
  - D. over population and an increase in crime necessitated the acquisition of new lands.
19. To find his longitudinal position a person would use
- A. a quadrant
  - B. a cross-staff
  - C. dead reckoning
  - D. an astrolabe
20. Popocatepeti, Ixtaccihuatl, Paricutin and Aconcagua are all high elevations of land. Aconcagua differs from the others because it is
- A. not an active volcano
  - B. a high plateau
  - C. not a part of the Cordillera system
  - D. located south of the Rio Grand River
21. Spanish explorers carried out the exploration of newly discovered lands with great energy. The most important reason for this was



the

- A. urge to Christianize the Indians
  - B. threat of loss of part of the new land to the Portugese
  - C. threat of the withdrawal of trade monopolies by the king if exploration and settlement failed.
  - D. lure of the riches which many Indian groups were found to possess
22. The Seven Years War, fought between England and France on the continent of Europe, had its North American counterpart in
- A. Pontiac's Rebellion
  - B. the French and Indian War
  - C. the American Revolutionary War
  - D. the War of 1812
23. In the early 1700's the English laid claim to greater amounts of land than did the French. The largest area held by the English was
- A. Rupert's Land
  - B. the area known as the Thirteen Colonies
  - C. the Louisiana Territory
  - D. the Great Central Plain
24. The term culture includes all the following except the
- A. habits of a people
  - B. institutions of a people
  - C. traditions of a people
  - D. race of a people
25. The trade wind regions
- A. are narrow bands along the geographical equator
  - B. lie poleward of the regions known as the horse latitudes
  - C. extend about 2000 miles on each side of the doldrums
  - D. extend about 2000 miles north of the tropics
26. A river with its tributaries is called
- A. a river basin
  - B. a river system
  - C. a river mouth
  - D. an estuary
27. The "Horse Latitudes" are belts of
- A. low pressure calms
  - B. polar calms
  - C. high pressure calms
  - D. desert winds





28. One of the main causes of planetary winds and calms is
- A. the rotation of the earth on its axis
  - B. the presence of large land masses
  - C. the presence of polar ice-caps
  - D. ocean currents and drifts
29. Fog is caused by
- A. rapid evaporation of water by the rays of the sun
  - B. icebergs in a cold ocean current
  - C. the air above a cold current meeting with the air above a warm current
  - D. cyclonic action of the air in the westerly wind belt
30. The atmospheric pressure at sea level is approximately
- A. fifteen pounds per square inch
  - B. five pounds per square inch
  - C. twenty-five pounds per square inch
  - D. sixty-two and a half pounds per square inch
31. Eastern Canada receives much of her petroleum requirements from the following Latin American country.
- A. Colombia
  - B. Brazil
  - C. Peru
  - D. Venezuela
32. The sextant is used in
- A. finding longitude
  - B. determining latitude
  - C. finding iron ore deposits
  - D. determining wind direction
33. An Indian tribe particular to the region north of the Rio Grande River is the
- A. Araucanians
  - B. Chibchas
  - C. Arapajos
  - D. Mayas
34. In Latin America the marriage of Portuguese and Spanish men to the Indian women resulted in a group in Latin America called the
- A. Mestizos
  - B. Hottentots
  - C. breeds
  - D. creoles





35. The purpose of the Papal Line of Demarcation was to
- A. stop France from moving into South America
  - B. separate Spanish and Portuguese areas of development
  - C. encourage Protestants to remain separate from Catholics in South America
  - D. keep Spanish settlers from moving into Mexico
36. Individuals of pure Spanish parenthood born in the Spanish colonies were referred to as
- A. peons
  - B. creoles
  - C. llaneros
  - D. caudillos
37. Of the following, the one feature that was not typical of Spanish control of the colonies was
- A. trade was restricted to Spain
  - B. Spanish officials knew little of the problems of the colonies
  - C. Viceroys were sent from Spain
  - D. the colonists were encouraged to develop their own governments
38. The ability of France and England to challenge Spain in the Western Hemisphere during the sixteenth century was decided by the
- A. increased use of money by England
  - B. desire of the English people for revenge on Spain
  - C. defeat of the Spanish armies in the colonies
  - D. defeat of the Spanish Armada
39. At one time Portugal was actually governed by a monarch from Brazil. This was due to
- A. a desire to spread the control of government fairly between homeland and colony.
  - B. The control by Napoleon of the Iberian Peninsula
  - C. a revolution among the Portuguese citizens
  - D. an interest by the monarch in his overseas territories
40. Spanish is not an official language in any country
- A. south of the Rio Grande
  - B. north of the Rio Grande
  - C. north of the Panama Canal
  - D. south of the Panama Canal
41. Democracy has in the past worked most successfully in
- A. Argentina
  - B. Brazil
  - C. Paraguay
  - D. Canada



42. Any ocean current flowing towards the equator is considered to be a cool current. An example of such a current is the
- A. Gulf Stream
  - B. Brazil Current
  - C. Peru Current
  - D. North Pacific Drift
43. On December 21, the sun is most nearly overhead at
- A. Buenos Aires
  - B. Havana
  - C. Rio de Janeiro
  - D. Mexico City
44. The first slaves to be brought to North America came in 1619 to
- A. Mississippi
  - B. Virginia
  - C. Rhode Island
  - D. Georgia
45. The New World was the original source of a number of foods, the most important of which today probably are
- A. yerba mate and cocoa
  - B. tomatoes and grapefruit
  - C. potatoes and corn
  - D. chocolate and chicle
46. In Alberta most of the precipitation is due to
- A. convection currents
  - B. mountains
  - C. warm air masses meeting with cold air masses
  - D. cold air being warmed up
47. On a hot sunny afternoon on a beach beside a large body of water you might reasonably expect
- A. a warm breeze to start blowing towards the water
  - B. a cool breeze to start blowing towards the land
  - C. a cool breeze to start blowing towards the water
  - D. a warm breeze to start blowing towards the land
48. The biggest producer of copper in Latin America is
- A. Chile
  - B. Mexico
  - C. Brazil
  - D. The United States



49. The Latin American country with the biggest variety of agricultural products is
- A. Brazil
  - B. Cuba
  - C. Peru
  - D. Argentina
50. After Ghana the next greatest producer of cacao in the world is
- A. Peru
  - B. Brazil
  - C. Venezuela
  - D. British Guiana
51. Latin America begins south of the
- A. Tropic of Cancer
  - B. Rio Grand
  - C. Panama Canal
  - D. Republic of Panama
52. An Indian people not found in South America were the
- A. Mayas
  - B. Incas
  - C. Chibchas
  - D. Araucanians
53. The Yucatan Peninsula was explored by
- A. Cortes
  - B. de Soto
  - C. de Vaca
  - D. de Leon
54. Brazil came into Portuguese possession by
- A. rights of discovery
  - B. conquest
  - C. negotiation with Spain at papal request
  - D. war with Spain





GRADE IX SOCIAL STUDIES ACHIEVEMENT TEST - Test No. 2

1. The trade wind regions
  - A. are narrow bands along the geographical equator
  - B. are wide bands along the geographical equator
  - C. extend about 2000 miles on each side of the doldrums
  - D. extend about 2000 miles north of the tropics
2. A river with its tributaries is called a
  - A. river basin
  - B. river system
  - C. river mouth
  - D. estuary
3. The "Horse Latitudes" are belts of
  - A. low pressure calms
  - B. polar calms
  - C. high pressure calms
  - D. doldrums
4. One of the main causes of planetary winds and calms is
  - A. the rotation of the earth on its axis
  - B. the presence of large land masses
  - C. the revolution of the earth in its orbit
  - D. ocean currents and drifts
5. Fog is caused by
  - A. rapid evaporation of water by the rays of the sun
  - B. icebergs in a cold ocean current
  - C. the air above a cold current meeting with the air above a warm current
  - D. cyclonic action of the air in the westerly wind belt
6. The atmospheric pressure, in pounds per square inch, at sea level is approximately
  - A. 5
  - B. 15
  - C. 25
  - D.  $62\frac{1}{2}$
7. In Alberta most of the precipitation is due to
  - A. convection currents
  - B. mountains
  - C. warm air masses meeting with cold air masses
  - D. cold air being warmed up



8. On a hot sunny afternoon on a beach beside a large body of water you might reasonably expect a
- A. Warm breeze to start blowing towards the water
  - B. Warm breeze to start blowing towards the land
  - C. Cool breeze to start blowing towards the land
  - D. Cool breeze to start blowing towards the water
9. The biggest producer of copper in Latin America is
- A. Brazil
  - B. Mexico
  - C. Chile
  - D. The United States
10. The Latin American country with the biggest variety of agricultural products is
- A. Peru
  - B. Argentina
  - C. Brazil
  - D. Cuba
11. After Ghana the next greatest producer of cacao in the world is
- A. Peru
  - B. British Guiana
  - C. Brazil
  - D. Venezuela
12. Latin America begins south of the
- A. Tropic of Cancer
  - B. Rio Grande
  - C. Panama Canal
  - D. Republic of Panama
13. An Indian people not found in South America were the
- A. Chibchas
  - B. Incas
  - C. Mayas
  - D. Araucanians
14. The Yucatan Peninsula was explored by
- A. de Soto
  - B. de Vaca
  - C. Cortes
  - D. de Leon



15. Brazil came into Portuguese possession by
- A. a payment of gold
  - B. conquest
  - C. negotiation with Spain at papal request
  - D. war with Spain
16. Spanish is not an official language in any country
- A. south of the Rio Grande
  - B. north of the Rio Grande
  - C. north of the Panama Canal
  - D. south of the Panama Canal
17. Democracy has in the past worked most successfully in
- A. Argentina
  - B. Paraguay
  - C. Canada
  - D. Brazil
18. Any ocean current flowing towards the equator is considered to be a cool current. An example of such a current is the
- A. Gulf Stream
  - B. Brazil Current
  - C. Peru Current
  - D. North Pacific Drift
19. The first slaves to be brought to North America came in 1619 to
- A. Mississippi
  - B. Rhode Island
  - C. Virginia
  - D. Georgia
20. The New World was the original source of a number of foods, the most important of which today probably are
- A. yerbe mate and cocca
  - B. tomatoes and grapefruit
  - C. potatoes and corn
  - D. chocolate and chicle
21. Eastern Canada receives much of her petroleum requirements from the following Latin American country
- A. Columbia
  - B. Venezuela
  - C. Selvas
  - D. Brazil



22. The sextant was used by navigators for
- A. finding longitude
  - B. determining latitude
  - C. finding iron ore deposits
  - D. determining wind direction
23. An Indian tribe particular to the region north of the Rio Grande River is the
- A. Araucanians
  - B. Chibchas
  - C. Arapajos
  - D. Hottentots
24. In Latin America the marriage of Portuguese and Spanish men to Indian women resulted in a group in Latin America called the
- A. mestizos
  - B. Hottentots
  - C. breeds
  - D. mulattos
25. The purpose of the Papal Line of Demarcation was to provide a
- A. means to stop France from moving into South America
  - B. separate Spanish and Portuguese areas of development
  - C. encouragement to Protestants to remain separate from Catholics in South America
  - D. enforce restrictions to keep Spanish settlers from moving into Mexico.
26. Individuals of pure Spanish parenthood born in the Spanish colonies were referred to as
- A. Pecns
  - B. creoles
  - C. mestizos
  - D. metis
27. Of the following, the one feature that was not typical of Spanish control of the colonies was
- A. trade was restricted to Spain
  - B. Spanish officials knew little of the problems of the colonies
  - C. Viceroys were sent from Spain
  - D. the colonists were encouraged to develop their own governments by elected representation
28. The ability of France and England to challenge Spain in the Western Hemisphere during the sixteenth century was decided by an
- A. increased use of money by England
  - B. desire of the English people for revenge on Spain
  - C. continued defeat of the Spanish armies in the colonies





- D. unprecedented defeat of the Spanish Armada
29. At one time Portugal was actually governed by a monarch from Brazil. This was due to
- A. desire to spread the control of government fairly between homeland and colony
  - B. the control by Napoleon of the Iberian Peninsula
  - C. revolution among the Portuguese citizens
  - D. interest by the monarch in his overseas territories
30. On December 21, the sun is most nearly overhead at
- A. Buenos Aires
  - B. Rio de Janeiro
  - C. Havana
  - D. Mexico City
31. As one descends in altitude from 3300 feet to 2800 feet the surrounding air normally
- A. decreases in temperature and increases in density
  - B. becomes more moist and less dense
  - C. increases in density and increases in temperature
  - D. increases in density and decreases in temperature
32. The standard of living of a group of people refers to the
- A. satisfaction of that group's basic wants
  - B. supply of natural resources
  - C. satisfaction of that group's basic needs for living
  - D. satisfaction of that group's artistic needs.
33. During which of our seasons do the North-East Winds blow south of the geographic equator?
- A. summer
  - B. autumn
  - C. winter
  - D. spring
34. Warm and cold currents affecting the Western Hemisphere are the
- A. North Pacific Drift and the Labrador Current
  - B. Japanese Current and the North Pacific Drift
  - C. North Pacific Drift and the Peru Current
  - D. Brazil Current and the North Pacific Drift
35. A continental type climate would usually be found
- A. near the coastline of the larger continents
  - B. in the interior of the larger continental areas
  - C. near the extreme northern fringe of Eurasia and North America
  - D. near interiors of the equatorial continental areas



36. A map projection having radiating meridians and curved parallels which depicts the northern and southern extremities of the world is the
- A. Homolosine projection
  - B. Homolographic projection
  - C. Polar projection
  - D. Mercator projection
37. The capital city of Ecuador is
- A. Asuncion
  - B. Quito
  - C. La Pas
  - D. Pretoria
38. The literary level of most of the Latin American states is quite low, a fact attributed for the most part to a lack of
- A. general disinterest of Latin America in education
  - B. plentiful natural resources
  - C. climate varieties which do not promote an active population
  - D. governmental leadership in this area
39. The poor transportation system in Latin America suffers least as a result of the
- A. lack of a continuous effort by governments to improve the facilities
  - B. lack of a general interest in improved transportation
  - C. lack of sufficient capital to carry out improvements
  - D. rugged terrain and tremendous distances involved in the transportation system.
40. Low latitude deserts are generally caused by
- A. the excess of evaporation rates over precipitation rates
  - B. lack of surrounding bodies of water
  - C. low pressure areas over these deserts
  - D. the absence of winds
41. The tundra region receives little precipitation because
- A. cold air contains little moisture
  - B. it is too cold to rain in this area
  - C. winds tend to blow from the warmer areas
  - D. winds tend to blow from the colder areas
42. Soils in the tropical rain forest regions are
- A. highly fertile because of the abundance of vegetation
  - B. of an alkaline nature because of the high rate of evaporation
  - C. generally lacking in humus or dead plant materials
  - D. lacking in minerals necessary for good crop growth due to leaching by heavy rains



43. Monsoon climatic regions usually have
- A. warm, humid continental regions
  - B. periods of excessively high rainfalls followed by long dry periods
  - C. continuous low pressure area associated with them
  - D. little support for the growth of heavy vegetation and are sparsely populated
44. The most successful industrial nation in Latin America is
- A. Chile
  - B. Mexico
  - C. Brazil
  - D. Quito
45. Which of the four western provinces is going ahead successfully in the development of potassium reserves?
- A. Alberta
  - B. British Columbia
  - C. Saskatchewan
  - D. Yukon
46. Which of the following Indian tribes was most nomadic in their habits?
- A. Iroquois
  - B. Mayans
  - C. Crees
  - D. Metis
47. Which of the following developed the highest form of civilization?
- A. Chimus
  - B. Araucanians
  - C. Incas
  - D. Sioux
48. With one exception, the statements below were reasons for the development of the Age of Exploration and Discovery. The exception is that
- A. the improvement in navigational science permitted longer voyage of ships out of sight of land
  - B. overland trade routes became blocked by the followers of Mohammed
  - C. the Crusades developed new understandings of other parts of the world and also created new wants by western man
  - D. over population, an increase in crime and racial segregation necessitated the acquisition of new lands







49. To find his longitudinal position a person would use
- A. quadrant
  - B. cross-staff
  - C. dead-reckoning
  - D. astrolabe
50. Popocatepetl, Ixtaccihuatl, Paricutin and Aconcagua are all high elevations of land. Aconcagua differs from the others because it is not
- A. an active volcano
  - B. a high plateau
  - C. a part of the Cordillera system
  - D. located south of the Rio Grande River
51. Spanish explorers carried out the exploration of newly discovered lands with great energy. The most important reason for this was an
- A. urge to Christianize the Indians
  - B. threat of loss of part of the new land to the Portugese
  - C. threat of the withdrawal of trade monopolies by the king if exploration and settlement failed
  - D. increased lure of riches which many Indian groups were found to possess
52. The Seven Years War, fought between England and France on the continent of Europe, had its North American counterpart in
- A. Pontiac's Rebellion
  - B. the French and Indian War
  - C. the French Revolution
  - D. the War of 1812
53. In the early 1700's the English laid claim to greater amounts of land than did the French. The largest area held by the English was
- A. the area known as the Thirteen Colonies
  - B. the Great Central Plain
  - C. Rupert's Land
  - D. Canada
54. The term culture includes all the following except the
- A. habits of a people
  - B. institutions of a people
  - C. race of a people
  - D. traditions of a people



GRADE IX SOCIAL STUDIES ACHIEVEMENT TEST - Test No. 3

1. Time changes one hour for every
  - A.  $15^{\circ}$  of longitude
  - B.  $35^{\circ}$  of longitude
  - C.  $15^{\circ}$  of latitude
  - D.  $22.5^{\circ}$  of longitude
2. The "heat equator" is an irregular line generally
  - A. south of the geographical equator
  - B. north of the geographical equator
  - C. on the geographical equator
  - D. concurrent with the geographical equator
3. Land and sea breezes are caused by
  - A. a cold current meeting a warm current
  - B. the presence of a mountain range on the windward side
  - C. seasonal changes in temperature
  - D. the unequal temperatures of land and water
4. Most of the land area on the earth's surface lies in the
  - A. tropics
  - B. northern hemisphere
  - C. southern hemisphere
  - D. Arctic and Antarctic circles
5. The barometer measures
  - A. temperature
  - B. humidity
  - C. wind intensity
  - D. air pressure
6. The Spanish explorer who searched for the fountain of youth was
  - A. Ponce de Leon
  - B. Vasco da Gama
  - C. Cortes
  - D. De Soto
7. Those with the greatest political power in the Spanish colonies were the
  - A. viceroys appointed by the king of Spain
  - B. elected representatives of the people
  - C. officers of the Spanish army
  - D. rich creole population



8. The most important reason for the failure of Raleigh's colony on Roanoke Island was that
- A. the island was not fertile
  - B. the climate was unusually severe
  - C. most of the colonists were not accustomed to doing
  - D. there was a shortage of wild game
9. On December 21st in regions north of latitude  $66\frac{1}{2}^{\circ}$  N. the sun's rays strike the earth's surface
- A. at nearly  $90^{\circ}$
  - B. at about  $66\frac{1}{2}^{\circ}$
  - C. at about  $10^{\circ}$
  - D. not at all
10. Vancouver has milder winters than Edmonton because
- A. it is closer to the equator
  - B. of the influence of the Japanese Current
  - C. of the mountains
  - D. of the altitude
11. "So carol, carol in your snow  
And carol, carol as ye may--  
We carol mid our blossoms ablow;  
The grace of Summer's Christmas Day."
- The poet who wrote the above lines could have been describing Christmas in
- A. Edmonton
  - B. New York
  - C. Rio de Janeiro
  - D. Mexico City
12. Brazil's iron and steel industry is at present hampered by a lack of
- A. electric power
  - B. skilled workers
  - C. supply of good coal
  - D. capital
13. As a result of settlement and conquest, the number of official languages in South America today is
- A. three
  - B. four
  - C. five
  - D. six





14. The first permanent white settlement in the Americas was established at
- A. Quebec
  - B. Jamestown
  - C. Cuba
  - D. Santa Domingo
15. A barrier to the westward movement of the settlers from the thirteen original colonies was
- A. the Appalachian Mountains
  - B. hostile Indians
  - C. dense forests
  - D. swampy land
16. The country with the most virgin land suitable for settlement is
- A. Argentina
  - B. Colombia
  - C. United States
  - D. Brazil
17. A culture that has changed least in the last 500 years would be found in
- A. Mexico City
  - B. Inuvik
  - C. a village on the Upper Amazon
  - D. the southwestern part of the United States
18. If you were to climb a mountain, you would find that as you climbed up
- A. both temperature and pressure would decrease
  - B. both temperature and pressure would increase
  - C. pressure would decrease and temperature would increase
  - D. pressure would increase and temperature would decrease
19. South America does not have a climate classified as
- A. humid continental
  - B. taiga
  - C. savanna
  - D. West Coast Marine
20. The rainy winters and the dry summers of the Mediterranean type of climate are due to the
- A. mountain barriers
  - B. longitudinal shifting of the meridians
  - C. ocean currents and altitude
  - D. latitudinal shifting of the pressure belts





21. Which of the following is NOT a national capital city?
- A. Rio de Janeiro
  - B. Sucre
  - C. Asuncion
  - D. Lima
22. Which of the following was closely associated with a group called the Pilgrims?
- A. James Endicott
  - B. Roger Williams
  - C. Jerry Potts
  - D. Henry Hudson
23. Industry grew in New England as a result of
- A. good coal supplies
  - B. ample water-power
  - C. cheap slave labour
  - D. local supplies of cotton
24. Which one of the following words best describes the typical Latin American government?
- A. efficient
  - B. inefficient
  - C. stable
  - D. unstable
25. Foreign investors are often reluctant to invest in industries in Latin America because of
- A. poor returns on investments
  - B. lack of interest in Latin American countries
  - C. fear of nationalization
  - D. lack of social services
26. Standard of living is influenced by all but one of the following factors. The one exception is the
- A. density of population
  - B. availability of natural resources
  - C. availability of trade sources
  - D. number of racial groups in a country
27. A degree of latitude equals approximately
- A. fifty miles
  - B. seventy miles
  - C. eighty miles
  - D. one hundred and ten miles



28. An isobar is
- A. geographic barrier to trade
  - B. the space or region just above the earth's atmosphere
  - C. a line on a map connecting regions having equal pressure
  - D. a region close to a continental shelf
29. An archipelago is a
- A. portion of land almost surrounded by water
  - B. narrow passage of water between two seas
  - C. group of many islands
  - D. narrow strip of land
30. A hot desert is a region in which
- A. the trade winds blow from the sea to the land
  - B. poor farming methods often cause soil erosion
  - C. the precipitation can only support a minimum of vegetation
  - D. people cannot live
31. A jet pilot left Vancouver at 10 A.M. on July 10th, landing five hours later in Tokyo, Japan, having changed his position by eighty degrees of longitude and fifteen degrees of latitude. His arrival time and date was
- A. ten a.m., July 10
  - B. ten a.m., July 11
  - C. five a.m., July 11
  - D. six a.m., July 10
32. An ocean current classed as a cool current is the
- A. North Pacific Drift
  - B. North Atlantic Drift
  - C. Gulf Stream
  - D. Humboldt Current
33. Winds are caused by
- A. the size and shape of the continents
  - B. the moon's gravitational pull
  - C. unequal heating of the earth's atmosphere
  - D. the circular movements of the ocean currents
34. Rail transportation in South America is poor because of the
- A. national jealousies existing among South American countries
  - B. desire of most of the South Americans for road travel
  - C. variety of track gauges existing in South America
  - D. refusal of other nations to provide capital for railroad building



35. Large quantities of nitrates are found in
- A. Chile
  - B. Peru
  - C. Brazil
  - D. Panama
36. Winds which bring winter precipitation to California are the
- A. South East Trade Winds
  - B. North East Trade Winds
  - C. North Westerlies
  - D. Polar North Easterlies
37. The Trade Winds are caused by air
- A. rushing in to fill up a low pressure area created by warm, rising air at the heat equator
  - B. moving in from the Horse Latitudes to the Sub-Polar Low
  - C. moving vertically under pressure of cooler outer winds
  - D. moving from a high pressure area at the Horse Latitudes to a low pressure area at the equator
38. At which latitude would a person see the sun higher at noon on December 22nd than a person at the equator on the same date and time
- A. twenty-three and a half degrees north latitude
  - B. sixty-six and a half degrees south latitude
  - C. zero degrees
  - D. twenty-three and a half degrees south latitude
39. A number of instruments and inventions including the caravel, enabled the European nations to embark on voyages of exploration during the fourteenth and fifteenth century. The caravel was a
- A. new type of sail for sailing ships
  - B. navigational instrument
  - C. flat map of the Atlantic Ocean regions
  - D. type of ship
40. The "Great Liberator" is a title given to
- A. San Martin
  - B. Prince Pedro
  - C. Simon Bolivar
  - D. Father Hidalgo
41. A set of statutes which angered the colonists of the Thirteen Colonies and prompted their revolt was the
- A. Corn Laws
  - B. Navigation Laws
  - C. Emancipation Regulations
  - D. Declaration of Independence





42. One of the first of the English attempts to colonize North America was at Roanoke Island. This attempt was organized by
- A. Sir Walter Raleigh
  - B. Sir Francis Drake
  - C. Sir Walter Scott
  - D. Lord Baltimore
43. A mechanical genius who aided in the liberation of Chile was
- A. Sebastian Cabot
  - B. Toussaint L'Ouverture
  - C. Father Beltran
  - D. Pedro Claver
44. Coffee, an important beverage the world over, is grown in large quantities in the
- A. southeastern highlands of Brazil
  - B. rain forest area of Brazil
  - C. southern plateau region of Argentina
  - D. humid sub-tropical area of Argentina
45. These three states contain most of the known silver deposits of Latin America
- A. Panama, Ecuador and Peru
  - B. Mexico, Honduras and Argentina
  - C. Peru, Mexico and Bolivia
  - D. Brazil, Paraguay and Uruguay
46. The most productive populations would be found in the
- A. humid, sub-tropical regions
  - B. tropical regions
  - C. tundra regions
  - D. marine climatic regions
47. The natural forests of the Mediterranean climatic region are usually described as
- A. luxuriant
  - B. sparse
  - C. scrub
  - D. profuse
48. The most successful petroleum producing state of Latin America is
- A. Brazil
  - B. Venezuela
  - C. Mexico
  - D. Argentina



49. Which of the following is not a mixed-blood group?
- A. Mestizos
  - B. Metis
  - C. Mulattos
  - D. Seminoles
50. The lack of truly democratic governments in Latin America is caused by
- A. a general disinterest by the people in any change
  - B. a realization that democracy could not improve the Latin American situation
  - C. a low level of literacy in most Latin American states
  - D. the rigid control held by dictators
51. Most of the Latin American colonies were treated oppressively by their motherlands. Which one of the following received the fairest treatment?
- A. Argentina
  - B. Brazil
  - C. Peru
  - D. Mexico
52. Which of the following countries did NOT attempt to colonize the eastern coast of North America?
- A. Spain
  - B. Sweden
  - C. Holland
  - D. Portugal
53. Portuguese interest in the Western Hemisphere during the Age of Exploration was slight because
- A. they had not developed the ability to navigate over large seas and oceans
  - B. they were committed to a papal decision
  - C. their explorative energies were directed north and north-east of Portugal
  - D. Portugal was a poor country and could not afford the luxury of voyages of exploration.
54. Which of the following had the shortest life as a New World Colony?
- A. New Amsterdam
  - B. New France
  - C. New England
  - D. New Sweden



GRADE IX SOCIAL STUDIES ACHIEVEMENT TEST - Test No. 4

1. Time changes one hour for every
  - A.  $15^{\circ}$  of latitude
  - B.  $15^{\circ}$  of longitude
  - C.  $35^{\circ}$  of longitude
  - D.  $22.5^{\circ}$  of latitude
2. Land and sea breezes are caused by
  - A. a cold current meeting a warm current
  - B. the presence of a mountain range on the windward side
  - C. seasonal changes in temperature
  - D. the unequal temperatures of land and water resulting in rising air that must be replaced
3. The "heat equator" is an irregular line generally
  - A. south of the geographical equator
  - B. north of the geographical equator
  - C. on the geographical equator
  - D. concurrent with the geographical equator
4. Most of the land area on the earth's surface lies in the
  - A. tropics
  - B. northern hemisphere
  - C. southern hemisphere
  - D. Arctic and Antarctic circles
5. The barometer measures
  - A. air density
  - B. humidity
  - C. air pressure
  - D. wind intensity
6. The Spanish explorer who searched for the fountain of youth was
  - A. Vasco da Gama
  - B. Ponce de Leon
  - C. Cortes
  - D. De Soto
7. A person with the greatest political power in the Spanish colonies was known as a
  - A. viceroy appointed by the king of Spain
  - B. elected representative of the people
  - C. officer of the Spanish army
  - D. rich creole





8. The most important reason for the failure of Raleigh's colony on Roanoke Island was that
- A. the island was not fertile
  - B. the climate was unusually severe
  - C. most of the colonists were not accustomed to doing farm work
  - D. there was a shortage of wild game
9. On December 21st in regions north of latitude  $66\frac{1}{2}^{\circ}\text{N}$ . the sun's rays
- A. strike the earth's surfact at about  $10^{\circ}$
  - B. strike the earth's surface at about  $66\frac{1}{2}^{\circ}$
  - C. strike the earth's surface at about  $90^{\circ}$
  - D. do not strike the earth's surface
10. Vancouver has milder winters than Edmonton because of the
- A. ocean
  - B. influence of the Japanese Current
  - C. mountains
  - D. altitude
11.                    "So carol, carol in your snow  
                         And carol, carol as ye may---  
                         We carol mid our blossoms ablow;  
                         The grace of Summer's Christmas Day."
- The poet who wrote the above lines could have been describing Christmas in
- A. Edmonton
  - B. California
  - C. Rio de Janeiro
  - D. Mexico City
12. Brazil's iron and steel industry is at present hampered by a
- A. inadequate amount of electric power
  - B. lack of skilled workers
  - C. minimal supply of good coal
  - D. insufficient capital investment
13. As a result of settlement and conquest, the number of official languages in South America today is
- A. two
  - B. three
  - C. five
  - D. six





14. The first permanent white settlement in the Americas was established at
- A. Quebec
  - B. Jamestown
  - C. Santa Domingo
  - D. Cuba
15. A natural barrier to the westward movement of the settlers from the thirteen original colonies was
- A. the Appalachian Mountains
  - B. hostile Indians
  - C. dense forests
  - D. swampy land
16. The country with the most virgin land suitable for settlement is
- A. Argentine
  - B. Brazil
  - C. Columbia
  - D. United States
17. A culture that has changed least in the last 500 years would be found in
- A. Mexico City
  - B. Inuvik
  - C. a village on the Upper Amazon
  - D. the southwestern part of the United States
18. If you were to climb a mountain, you would find that as you climbed up temperature
- A. and pressure would decrease
  - B. and pressure would increase
  - C. would increase and pressure would decrease
  - D. would decrease and pressure would increase
19. South America does not have a climate classified as
- A. humid continental
  - B. taiga
  - C. savanna
  - D. West Coast Marine
20. The rainy winters and the dry summers of the Mediterranean type of climate are due to the
- A. mountain barriers
  - B. longitudinal shifting of the meridians
  - C. ocean currents and altitude
  - D. latitudinal shifting of the pressure belts



21. Which of the following is not a national capital city?
- A. Rio de Janeiro
  - B. Sucre
  - C. Asuncion
  - D. Lima
22. Which of the following was closely associated with a group called the Pilgrims?
- A. James Endicott
  - B. Roger Williams
  - C. Jerry Potts
  - D. Henry Hudson
23. Which of the following had the shortest life as a New World Colony?
- A. New Amsterdam
  - B. New Sweden
  - C. New England
  - D. New France
24. Industry grew in New England as a result of an
- A. abundant supply of good coal
  - B. ample water-power
  - C. cheap slave labor
  - D. local supplies of cotton
25. Which one of the following words best describes the typical Latin American government?
- A. efficient
  - B. inefficient
  - C. stable
  - D. unstable
26. Foreign investors are often reluctant to invest in industries in Latin America because of
- A. poor returns on investments
  - B. lack of interest in Latin American countries
  - C. fear of nationalization by the Latin American countries
  - D. lack of social services
27. A degree of latitude equals approximately
- A. one hundred miles
  - B. eighty miles
  - C. seventy miles
  - D. fifty miles
28. Standard of living is influenced by all but one of the following factors. The one exception is the



- A. availability of manufactured products
  - B. availability of natural resources
  - C. availability of trade sources
  - D. number of racial groups in a country
29. An isobar is a
- A. the common geographic barrier to trade
  - B. the space or region just above the earth's atmosphere
  - C. line on a map connecting regions having equal pressure
  - D. region close to a continental shelf
30. An archipelago is a
- A. portion of land almost surrounded by water
  - B. passage of narrow water between two seas
  - C. group of many islands
  - D. strip of narrow land
31. A hot desert is a region in which
- A. the trade winds blow from the sea to the land
  - B. poor farming methods often cause soil erosion
  - C. the scant precipitation can only support a minimum of vegetation
  - D. people cannot live
32. A jet pilot left Vancouver at 10 A.M. on July 10th, landing five hours later in Tokyo, Japan, having changed his position by eighty degrees of longitude and fifteen degrees of latitude. His arrival time and date was
- A. ten a.m., July 10
  - B. six a.m., July 10
  - C. ten a.m., July 11
  - D. five a.m. July 11
33. An ocean current classed as a cool current is the
- A. North Pacific Drift
  - B. Humboldt Current
  - C. North Atlantic Drift
  - D. Gulf Stream
34. Winds are caused by unequal
- A. size and shape of the continents
  - B. moon's gravitational pull
  - C. heating of the earth's atmosphere
  - D. circular movements of the ocean currents





35. Rail transportation in South America is poor because of the
- A. national jealousies existing among South American countries
  - B. desire of most of the South Americans for road travel
  - C. variety of track gauges existing in South America that provides a poor means of using connecting rail lines
  - D. refusal of other nations to provide capital for railroad building
36. Large quantities of nitrates are found in
- A. Chile
  - B. Peru
  - C. Lima
  - D. Panama
37. Winds which bring winter precipitation to California are the
- A. South Trade Winds
  - B. North Trade Winds
  - C. North Westerlies
  - D. Polar North Easterlies
38. The Trade Winds are caused by air
- A. rushing in to fill up a low pressure area created by a warm rising air at the heat equator where they pick up or absorb moisture
  - B. moving in from the Horse Latitudes to the Sub-Polar Low
  - C. moving vertically under pressure of cooler outer winds
  - D. moving from a high pressure area at the Horse Latitudes to a low pressure area at the equator
39. At which latitude would a person see the sun higher at noon on December 22nd than a person at the equator on the same date and time?
- A. twenty-three and a half degrees north latitude
  - B. ninety degrees north latitude
  - C. zero degrees
  - D. twenty-three and a half degrees south latitude
40. A number of instruments and inventions including the caravel, enabled the European nations to embark on voyages of exploration during the fourteenth and fifteenth century. The caravel was a
- A. improved type of sail for sailing ships
  - B. instrument used for navigation
  - C. flat map of the Atlantic Ocean Regions
  - D. type of ship



41. The "Great Liberator" is a title given to
- A. San Martin of Argentina
  - B. Prince Pedro
  - C. Simon Bolivar of Venezuela
  - D. Father Hidalgo
42. A set of laws which angered the colonists of the Thirteen Colonies and prompted their revolt was the
- A. Corn Laws
  - B. Navigation Laws
  - C. Emancipation Regulations
  - D. Declaration of Independence
43. One of the first of the English attempts to colonize North America was at Roanoke Island. This attempt was organized by
- A. Sir Francis Drake
  - B. Sir Walter Scott
  - C. Sir Walter Raleigh
  - D. Lord Baltimore
44. A mechanical genius who aided in the liberation of Chile was
- A. Sebastian Cabot
  - B. Toussaint L'Ouverture
  - C. Father Beltran
  - D. Pedro Claver
45. Coffee, an important beverage the world over, is grown in large quantities in the
- A. southern plateau region of Argentina
  - B. humid sub-tropical area of Brazil
  - C. southeastern highlands of Brazil
  - D. rain forest of Brazil
46. These three states contain most of the known silver deposits of Latin America
- A. Panama, Ecuador and Peru
  - B. Mexico, Honduras and Argentina
  - C. Peru, Mexico and Bolivia
  - D. Bolivia, Brazil, Peru
47. The most productive populations would be found in the
- A. humid, sub-tropical regions
  - B. tropical regions
  - C. marine climatic regions
  - D. tundra regions



48. The natural forests of the Mediterranean climatic region are usually described as
- A. luxuriant
  - B. sparse
  - C. scrub
  - D. profuse
49. The most successful petroleum producing state of Latin America is
- A. Brazil
  - B. Venezuela
  - C. Mexico
  - D. Argentina
50. Which of the following is not a mixed-blood group?
- A. mestizos
  - B. seminole
  - C. metis
  - D. mulattos
51. The lack of truly democratic governments in Latin America is caused by
- A. a general disinterest by the people in any change
  - B. a realization that democracy could not improve the Latin American situation
  - C. a low level of literacy which results in minimal distribution of information about democracy and forms of government in most Latin American states
  - D. the rigid control held by dictators
52. Most of the Latin American colonies were treated oppressively by their motherlands. Which one of the following received the fairest treatment?
- A. Argentina
  - B. Peru
  - C. Brazil
  - D. Selvas
53. Which one of the following countries did not attempt to colonize the eastern coast of North America?
- A. Spain
  - B. Sweden
  - C. Portugal
  - D. Holland



54. Portuguese interest in the Western Hemisphere during the Age of Exploration was slight because
- A. they had not developed the ability to navigate over large seas and oceans
  - B. they were committed to a Papal decision that specified the Papal Line of Demarcation which granted a specified portion of unexplored land to Portugal
  - C. their explorative energies were directed north and north-east of Portugal
  - D. Portugal was a poor country and could not afford the luxury of voyages of exploration





## A P P E N D I X   B

### Rules of Good Test Making



## RULES OF GOOD TEST MAKING

1. Multiple choice items should have only one correct answer.
2. The item as a whole should be realistic and practical.
3. Keep the reading difficulty low in relation to the group taking the test unless the purpose is to measure verbal and reading abilities.
4. Do not lift a statement verbatim from the text book, manual or other text.
5. The item should ask a question which demands knowledge or understanding of the subject matter or job. An item should not be answerable by general knowledge if the purpose is to test achievement.
6. Each item should be independent of every other item in a test.
7. In a group of items of the same type, correct or best responses should be randomized, that is allotted randomly among the various positions according to a table of random numbers.
8. The number of options used in the multiple-choice question differs in different tests, to reduce the guessing factor, it is best to have at least four or preferably five options for each item.
9. The problem must be stated accurately and generally should not include irrelevant material.
10. The stem should be stated in positive form.
11. Avoid giving clues to the correct answer.
  - (a) The misleads should be important plausible answers rather than obvious misleads.
  - (b) The best answer should not be given away by irrelevant details; and the distractors should contain no specific determinees or extraneous clues that would indicate that they are considered incorrect.
  - (c) The length of the options should be similar. There is a tendency for the correct answer to be longer than the incorrect.
  - (d) The alternatives should deal normally with similar ideas or information expressed in parallel form.
  - (e) Beware of clang association. If the stem and the keyed answer "sound alike," the examinee may get the question.
  - (f) Beware of irrelevant grammatical cues. Be sure that each option is a grammatically correct completion of the stem. Cues from the form of words ("a" versus "an"), number or tense of verb etc. must be excluded.



- (g) Items designed to measure understandings, insights, or ability to apply principles should be presented in novel terms.

Note: The above rules were taken from a handout prepared by test experts teaching Ed. 478; Measurements and Evaluation, at the University of Alberta Edmonton, Faculty of Education.





## A P P E N D I X   C

### Test-Wiseness Principles



## AN OUTLINE OF TEST-WISENESS PRINCIPLES

### PART I Elements independent of test constructor or test purpose.

#### A. Time-using strategy

1. Begin to work as rapidly as possible with reasonable assurance of accuracy.
2. Set up a schedule for progress through the test
3. Omit or guess at items which resist a quick response.
4. Mark omitted items, or items which could use further consideration, to assure easy relocation.
5. Use time remaining after completion of the test to reconsider answers.

#### B. Error-avoidance strategy

1. Pay careful attention to directions, determining clearly the nature of the task and the intended basis for response.
2. Pay careful attention to the items, determining clearly the nature of the question.
3. Ask examiner for clarification when necessary, if it is permitted.
4. Check all answers.

#### C. Guessing Strategy

1. Always guess if right answers only are scored.

#### D. Deductive reasoning strategy.

1. Eliminate options which are known to be incorrect and choose from among the remaining options.
2. Choose neither or both of two options which imply the correctness of each other.
3. Choose neither or one (but not both) of two statements, one of which, if correct, would imply the incorrectness of the other.
4. Restrict choice to those options which encompass all of two or more given statements known to be correct.
5. Utilize relevant content information in other test items and options.



PART II Elements dependent upon the test constructor or purpose.

A. Intent consideration strategy.

1. Answer items as the test constructor intended.
2. Consider the relevance of specific detail.

B. Cue-Using strategy.

1. The correct response maybe placed in a certain physical position among the options.
2. The correct answer maybe qualified more carefully, or made to represent a higher degree of generalization.
3. There is a general tendency for the correct options to be longer than the false ones.
4. The misleads may not be plausible answers.
5. The best answer maybe given away by irrelevant details.
6. The alternatives may not deal with similar ideas or information expressed in parallel form.
7. The stem and the answer may sound alike.
8. Some options may not be a grammatically correct completion, of the stem. Cues may be taken from words such as: "a" versus "an" and number or tense of verb.
9. The correct choice maybe in a certain logical position. The foils are usually the extremes in both directions.
10. The question maybe composed of familiar names.
11. Recognize and make use of resemblances between the options and an aspect of the stem.



## ELABORATION OF SELECTED PRINCIPLES

### PART I Elements independent of test constructor or test purposes.

#### A. Time-using strategy

1. Begin to work as rapidly as possible with reasonable assurance of accuracy.

The pace at which one can work without sacrificing accuracy varies with individuals. One should attempt, however, to complete the test in less time than is allotted in order to allow time to check answers.

2. Set up a schedule for progress through the test.

A rule of thumb is to determine how far one should be when a specific proportion of the testing period has elapsed. A periodic check on rate of progress facilitates the maintenance of proper speed. This principle suggests the necessity of determining the scope of the test before beginning work.

3. Omit or guess at items which resist a quick response.

When time is limited the examinee should work first on those items which will yield the most points in a given amount of time. The order in which he works on the items may be determined by the relative difficulty of items by the relative time needed to read and answer the items or by possible heavier weighting of some items. If such differences are not apparent, the examinee should work in order of presentation of the items.

4. Mark omitted items, or items which could use further consideration, to assure easy relocation.
5. Use time remaining after completion of the test to reconsider answers.

Change answers if it seems desirable. Examinees generally increase their scores when they do. There is some evidence that persistence (i.e. using full time on test) pays off.

#### B. Error-avoidance strategy.

1. Pay careful attention to directions, determining clearly the nature of the task and the intended basis for response.





2. Pay careful attention to the items, determining clearly the nature of the question.

Guard against inferring the answer before completely reading the question. Exercise special care in answering more complex questions such as negatively stated items having more than one clause.

3. Ask examiner for clarification when necessary, if it is permitted.
4. Check all answers.

C. Guessing strategy.

1. Always guess if right answers only are scored.

D. Deductive reasoning strategy.

The test-wise person who does not know the correct option directly may be able to deduce the answer by logical analysis or by using information gained from other items.

1. Eliminate options which are known to be incorrect and choose from among remaining options.

The examinee may be able to eliminate some options with partial knowledge of the subject matter. Options may often be eliminated because they are logically inconsistent with the stem.

Examples:

The state with the highest total population in the United States in 1950 was

- A. New York
- B. Chicago
- C. Michigan
- D. California

Option B is inconsistent with the stem since it is not a state, and the choice is, therefore, restricted to A, C, or D.

Which one of the following is an advantage of using high beds in hospitals?

- A. High beds cost more than regular size beds.
- B. The care of patients is less difficult when the beds are high.
- C. High beds can be used all day.
- D. People are less likely to fall out of high beds.

Since high cost is never an advantage to the buyer, option A is logically inconsistent with the stem and may be eliminated.



2. Choose neither or both of two options which imply the correctness of each other.

Example:

A vertical union takes in workers (members) on the basis of

- A. industry
- B. trade
- C. years of experience and training
- D. qualifications.

If only one answer can be chosen and the examinee knows that C and D are the same, the answer must be either A or B. Care must be taken in deciding whether two options imply the correctness of each other.

3. Choose neither or one (but not both) of two statements, one which, if correct, would imply the incorrectness of the other. This situation occurs most frequently with items containing options which are the opposite of each other.

Example:

The repeal of the Corn laws in 1846 had the following effect upon conditions in Britain.

- A. the price of food dropped.
- B. the farmers of England had better incomes.
- C. the cost of living went up.
- D. imported food became more expensive.

Because the correctness of option A implies the incorrectness of option C, both option A and option C cannot be correct.

4. Restrict choice to those options which encompass all of two or more given statements known to be correct. When "all of the above" or "none of the above" are used they are often the right answer.

Examples:

Which of the following men were presidents of the United States?

- A. George Washington
- B. Andrew Jackson
- C. Abraham Lincoln
- D. All of the above.

A test-wise examinee who was sure that Washington and Lincoln were presidents but was undecided about Jackson would nevertheless select option D.

The National Housing Act was passed primarily to make it possible for

- A. people to purchase homes with a low down-payment
- B. people to have their own home and with less financial burden



- C. people to get free homes
- D. people to have low-rental homes.

The more inclusive option B would be chosen by a test-wise person who knew that at least two of the other three choices were correct and that there was only one keyed answer.

5. Utilize relevant content information in other test items and options.

Examples:

Which one of the following four animals is warm-blooded

- A. snake
- B. frog
- C. bird
- D. lizard

Which one of the following four animals is cold-blooded?

- A. snake
- B. dog
- C. kangaroo
- D. whale

Assume the examinee knows that a bird is a warm-blooded animal, and that all animals are either warm-blooded or cold-blooded but not both. He can then reason that a snake, which is an option in both items, must be a cold-blooded animal and can, therefore, answer the second question.

## PART II Elements dependent upon the test constructor or purpose.

### A. Intent consideration strategy

1. Answer items as the test constructor intended.

If the examinee believes that the test constructor had a certain answer in mind, but the examinee can think of a possible objection to the answer, he should answer the item as he believes the test constructor intended. That is, he should choose the option he believes has the greatest chance of being correct, even though others have merits and even though the chosen option is not completely satisfactory.

2. Consider the relevance of specific detail.

The specific detail in an item may or may not have bearing upon the answer.

Example:

A picture of George Washington, the most influential man in shaping the history of the United States

- A. appears on the American one dollar bill







- B. appears on the Canadian one dollar bill
- C. appears on the cover of most United States history books
- D. appears on the British one dollar bill.

The examinee would have to decide whether the added information about Washington was inserted by an enthusiastic admirer of Washington, or whether it had relevance to the answer.

#### B. Cue-using strategy

These cues should be used only when the examinee is unable to arrive at the answer using his knowledge of the subject matter and his reasoning ability.

1. The correct response maybe placed in a certain physical position among the options.

If you have no idea at all about any of the options and there is no correction for guessing always choose the 2nd or 3rd option.

2. The correct answer maybe qualified more carefully, or made to represent a higher degree of generalization.

Statements that contain all, always, no, never, none, and nothing represent such broad generalizations that they are likely to be an unacceptable answer. Qualified statements, statements involving such terms as usually, sometimes, often, and as a rule, are more likely to be the acceptable answer.

##### Example:

The Governments are involved when corporations are formed because

- A. they are interested in obtaining corporation taxes
- B. they always have to lend new corporations money
- C. the corporations need the advice of government ministers
- x D. the government is usually seeking to protect the public from illegal corporation activities.

B. and C. contain broad generalizations while D. has the qualifying word "usually", therefore B. and C. can be rejected and D. accepted.

3. There is a general tendency for the correct options to be longer than the false ones.

##### Example:

A horizontal union

- x A. could take its members from several industries provided they work at the same type of job
- B. could include more professional types of employees
- C. is limited within the borders of one country
- D. is typified by the United Mine Workers of America.



Often the best answer contains qualifying statements to insure its correctness which increases its length.

4. The misleads may not be plausible answers.

Example:

An important qualification for a bus driver is that he have

- A. a knowledge of history
- B. relatives who will ride the bus
- x C. a license to drive a bus or truck
- D. a good speaking voice

The false options are so implausible that they can be eliminated easily by a person who grasps their meaning only vaguely.

5. The best answer maybe given away by irrelevant details.

Example:

The multiplier is a term used in

- x A. multiplication
- B. division
- C. addition
- D. subtraction

6. The alternatives may not deal with similar ideas or information expressed in parallels form

Example:

In the army service forces a grade I clerk-typist must

- A. be able to type from copy at the rate of 30 net words per minute
- B. maintain the confidential files
- C. dust the desks
- D. be punctual.

7. The stem and the answer may sound alike.

Example:

The Combines Investigation Act

- A. made the joining of workmen into unions illegal
- B. protected farmers from the purchase of farm machinery
- C. passed regulations for mines and factories regarding children
- x D. forbids corporations to combine for the purpose of setting or controlling prices.

8. Some options may not be a grammatically correct completion of the stem. Cues may be taken from words such as: ("a" versus "an") and number or tense of verb.

Example:

The United Grain Growers and the Wheat Pool are examples of

- A. a government enterprise
- x B. consumers' cooperative
- C. a producers' cooperative
- D. single proprietorships.

Options A and C are singular and therefore can be eliminated.



On a building project the bricklayers were setting up some wooden platforms to hold their bricks. Then the carpenters refused to work, claiming that this was work that they should do. This is an example of an

- A. a general strike
- x B. immediate jurisdictional strike
- C. a sit-down strike
- D. a sympathy strike

Only B is a grammatically correct completion of the stem

9. The correct choice maybe in a certain logical position. The foils are usually the extremes in both directions.

Example:

The population of Albany, New York in 1960 was approximately

- x A. 130,000
- B. 460,000
- C. 75,000
- D. 220,000

B and C represent the extreme figures and these can usually be eliminated as a possibility. The answer must therefore be A or D.

10. The question maybe composed of familiar names.

Example:

Planting a sloping field alternately with rows of corn, then rows of wheat, then rows of corn, etc., is called

- A. contour farming
- B. clean farming
- C. crop rotation
- D. strip cropping.

The examinee may only remember one or two of the terms mentioned as having been used in the class. The correct answer is probably one of the known terms.

11. Recognize and make use of resemblances between the options and an aspect of the stem. These resemblances may take the form of a direct repetition synonym or more

Example of direct repetition:

The aeronautics board which has jurisdiction over civil aircraft is called

- x A. Civil Aeronautics Board
- B. Committee to Investigate Airlines
- C. Division of Passenger Airways

Examples of general associative connections

Glean

- A. polish
- B. gather
- C. skim
- D. praise





The similarity between the sounds and spelling of glean and gleam creates an associative connection which would lead the test-wise person to consider option 1 as merely an attractive wrong answer.





## A P P E N D I X   D

Differences in Variances and the  
Welch T Prime Approximations



TABLE I

F TEST - DIFFERENCES BETWEEN VARIANCES OF THE RURAL SAMPLE

GROUP 1	GROUP 2	VARIANCE		VARIANCE		DF		F	P-ONE TAIL	SIGNIFICANCE
		1	2	1	2	1	2			
Control A	Exper. A	15.75	37.66	12	14	14	14	2.391	0.0306	S
Control A	Placebo A	15.75	42.60	12	14	14	14	2.704	0.0198	S
Exper. A	Placebo A	37.66	42.60	14	14	14	14	1.131	0.2053	NS
Control B	Exper. B	46.68	51.45	13	13	13	13	1.102	0.2158	NS
Control B	Placebo B	46.68	54.66	13	13	13	13	1.171	0.1951	NS
Exper. B	Placebo B	51.45	54.66	13	13	13	13	1.062	0.2287	NS
Control B	Exper. B	21.67	34.37	13	13	13	13	1.586	0.1042	NS
Control B	Placebo B	21.67	55.63	13	13	13	13	2.567	0.0253	S
Exper. B	Placebo B	34.37	55.63	13	13	13	13	1.619	0.0992	NS
Control A	Exper. A	22.98	48.86	12	14	14	14	2.126	0.0449	S
Control A	Placebo A	22.98	46.09	12	14	14	14	2.005	0.0537	NS
Exper. A	Placebo A	48.86	46.09	14	14	14	14	1.060	0.2286	NS



TABLE II

F TEST - DIFFERENCES BETWEEN VARIANCES OF THE URBAN SAMPLE

GROUP 1	GROUP 2	VARIANCE		DF	DF	F	P-ONE TAIL		SIGNIFICANCE
		1	2	1	2		1	2	
Control A	Exper. A	82.55	51.70	19	19	1.597	0.0791		NS
Control A	Placebo A	82.55	39.90	19	18	2.069	0.0323		S
Exper. A	Placebo A	51.70	39.90	19	18	1.296	0.1466		NS
Control B	Exper. B	50.13	54.32	18	20	1.083	0.2142		NS
Control B	Placebo B	50.13	76.09	18	17	1.518	0.0987		NS
Exper. B	Placebo B	54.32	76.09	20	17	1.401	0.1217		NS
Control B	Exper. B	61.93	75.92	18	20	1.226	0.1639		NS
Control B	Placebo B	61.93	46.89	18	17	1.321	0.1427		NS
Exper. B	Placebo B	75.92	46.89	20	17	1.619	0.0799		NS
Control A	Exper. A	59.55	38.05	19	19	1.565	0.0843		NS
Control A	Placebo A	59.55	39.67	19	18	1.501	0.0985		NS
Exper. A	Placebo A	38.05	39.67	19	18	1.043	0.2332		NS





TABLE III

WELCH T PRIME APPROXIMATION ON VARIABLES  
OF THE RURAL SAMPLE

GROUP 1	GROUP 2	TEST	DF	T PRIME	P-TWO TAIL	SIGNIFICANCE
Control A	Exper. A	4	24.20	3.30	0.0011	VS
Control A	Placebo A	4	23.50	1.51	0.1325	NS
Exper. A	Placebo A	4	27.89	1.44	0.1512	NS
Control B	Exper. B	3	25.94	2.00	0.0473	S
Control B	Placebo B	3	25.84	1.06	0.2896	NS
Exper. B	Placebo B	3	25.98	0.88	0.3788	NS
Control B	Exper. B	2	24.73	1.89	0.0600	NS
Control B	Placebo B	2	21.79	0.30	0.7615	NS
Exper. B	Placebo B	2	24.63	1.21	0.2273	NS
Control A	Exper. A	1	24.80	1.00	0.3187	NS
Control A	Placebo A	1	25.06	1.81	0.0724	NS
Exper. A	Placebo A	1	27.98	0.69	0.4917	NS



TABLE IV

WELCH T PRIME APPROXIMATION ON VARIABLES  
OF THE URBAN RESULTS

GROUP 1	GROUP 2	TEST	DF	T PRIME	P-TWO TAIL	SIGNIFICANCE
Control A	Exper. A	4	36.09	2.34	0.0206	S
Control A	Placebo A	4	33.97	1.35	0.1790	NS
Exper. A	Placebo A	4	36.78	1.24	0.2164	NS
Control B	Exper. B	3	37.85	1.53	0.1283	NS
Control B	Placebo B	3	32.78	0.22	0.8297	NS
Exper. B	Placebo B	3	33.51	1.55	0.1219	NS
Control B	Exper. B	2	38.00	1.03	0.3032	NS
Control B	Placebo B	2	34.76	0.38	0.7068	NS
Exper. B	Placebo B	2	36.76	1.45	0.1484	NS
Control A	Exper. A	1	36.24	0.68	0.4980	NS
Control A	Placebo A	1	36.20	1.97	0.0497	S
Exper. A	Placebo A	1	36.80	1.47	0.1421	NS



## A P P E N D I X   E

Classification of items by level of difficulty



TABLE I

CLASSIFICATION OF ITEMS BY LEVEL OF DIFFICULTY FOR TEST NO. 1

<u>LEVEL OF DIFFICULTY</u>	<u>NUMBER OF ITEMS</u>
0.900 - 1.000 (easy items)	
0.800 - 0.899	4
0.700 - 0.799	3
0.600 - 0.699	7
0.500 - 0.599	10
0.400 - 0.499	13
0.300 - 0.399	5
0.200 - 0.299	7
0.100 - 0.199	5
0.000 - 0.099 (difficult items)	

TABLE II

CLASSIFICATION OF ITEMS BY LEVEL OF DIFFICULTY FOR TEST NO. 2

<u>LEVEL OF DIFFICULTY</u>	<u>NUMBER OF ITEMS</u>
0.900 - 1.000 (easy items)	
0.800 - 0.899	2
0.700 - 0.799	4
0.600 - 0.699	9
0.500 - 0.599	13
0.400 - 0.499	11
0.300 - 0.399	9
0.200 - 0.299	5
0.100 - 0.199	1
0.000 - 0.099 (difficult items)	





TABLE III

CLASSIFICATION OF ITEMS BY LEVEL OF DIFFICULTY FOR TEST NO. 3

<u>LEVEL OF DIFFICULTY</u>	<u>NUMBER OF ITEMS</u>
0.900 - 1.000 (easy items)	
0.800 - 0.899	2
0.700 - 0.799	8
0.600 - 0.699	6
0.500 - 0.599	14
0.400 - 0.499	9
0.300 - 0.399	11
0.200 - 0.299	2
0.100 - 0.199	2
0.000 - 0.099 (difficult items)	

TABLE IV

CLASSIFICATION OF ITEMS BY LEVEL OF DIFFICULTY FOR TEST NO. 4

<u>LEVEL OF DIFFICULTY</u>	<u>NUMBER OF ITEMS</u>
0.900 - 1.000 (easy items)	
0.800 - 0.899	3
0.700 - 0.799	6
0.600 - 0.699	9
0.500 - 0.599	9
0.400 - 0.499	11
0.300 - 0.399	9
0.200 - 0.299	6
0.100 - 0.199	1
0.000 - 0.099 (difficult items)	





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